

(12) INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

(19) World Intellectual Property Organization  
International Bureau



(43) International Publication Date  
10 April 2003 (10.04.2003)

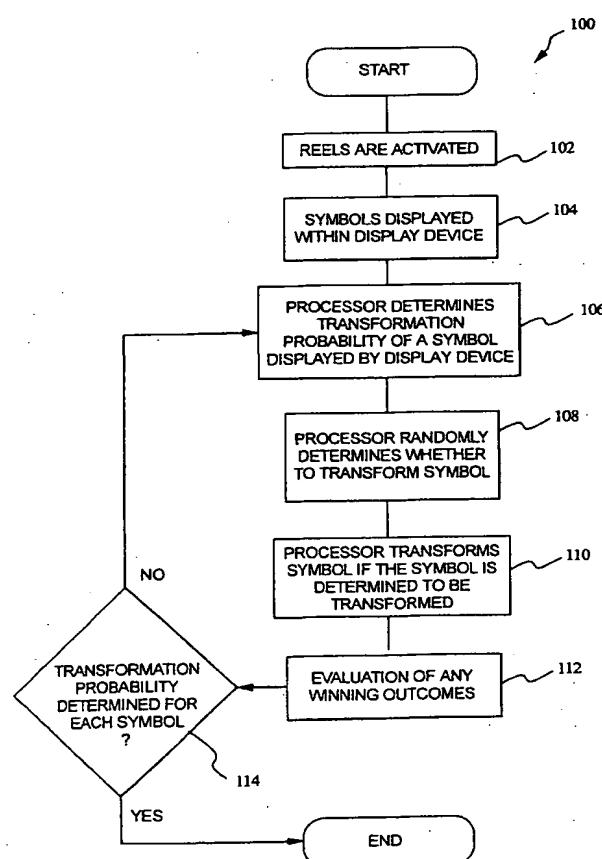
PCT

(10) International Publication Number  
**WO 03/030116 A1**

- (51) International Patent Classification<sup>7</sup>: **G07F 17/34**
- (21) International Application Number: **PCT/US02/30716**
- (22) International Filing Date:  
27 September 2002 (27.09.2002)
- (25) Filing Language: English
- (26) Publication Language: English
- (30) Priority Data:  
60/325,976 28 September 2001 (28.09.2001) US
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- (81) Designated States (*national*): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KR, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SD, SE, SG, SI, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, UZ, VN, YU, ZA, ZM, ZW.
- (84) Designated States (*regional*): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

[Continued on next page]

(54) Title: GAMING DEVICE HAVING SYMBOLS WITH TRANSFORMATION PROBABILITIES



(57) Abstract: A gaming device (10a) includes reel symbols (34) having a transformation probability. The game begins when a plurality of reels are activated (102). A plurality of symbols are randomly generated and displayed (104). Upon a game-triggering event, the processor determines the transformation probability of a symbol displayed on gaming device (106). The processor then randomly determines whether to transform a symbol based on the transformation probability associated with that symbol (108). The processor transforms the symbol if the symbol is determined to be transformed (110). The processor makes an evaluation to determine if there are any winning combinations displayed on the gaming device (112). Upon determining the transformation probability for each symbol, the game ends (114).

WO 03/030116 A1

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**Published:**

— *with international search report*

*For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.*

**S P E C I F I C A T I O N****TITLE OF INVENTION****"GAMING DEVICE HAVING SYMBOLS WITH TRANSFORMATION  
PROBABILITIES"**

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**PRIORITY CLAIM**

This application is a non-provisional patent application of and claims the benefit of U.S. Provisional Patent Application Serial No. 60/325,976, filed September 28, 2001.

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**BACKGROUND OF THE INVENTION**

Many known gaming devices provide wild symbols. Wild symbols provide a player with an additional opportunity to obtain winning combinations. The use of wild symbols in gaming devices provides additional excitement and entertainment for players.

In a slot machine having reels, a wild symbol can enable the matching of symbols along a payline to achieve a combination. For example, in a three reel slot machine, the symbols along a payline on the first, second and third reels may be, respectively, a heart, a heart and a wild symbol. If, in the 20 gaming scheme, the gaming device awards a player for a three heart combination, the wild symbol substitutes for a heart and provides the player with that combination.

In one example, U.S. Patent No. 6,089,977 discloses a gaming device having a roaming wild symbol. More specifically, this patent discloses a 25 gaming device having a plurality of virtual reels which have a set of symbols. Certain symbol combinations serve as triggering events. When one of these combinations occurs on the reels, a wild card symbol appears on the reels in the form of a graphical image and appears along the reels in a set, predetermined path. As the wild card symbol appears at a location, the 30 symbols transform into the wild card symbol. After each appearance of the wild card symbol, the gaming device determines and pays the player for any winning combination which is the result of the transformation. When the wild

card symbol appears at the next adjacent symbol, the symbol previously transformed reverts to its original state.

To increase player enjoyment and excitement, it is desirable to provide gaming devices having new and different wild symbol schemes.

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### SUMMARY OF THE INVENTION

The present invention provides a gaming device which includes symbols which in one embodiment, when displayed, may transform into wild symbols or other functional symbols based on a transformation probability associated with one or more of the particular displayed symbols. In one preferred embodiment of the present invention, the gaming device includes an activator symbol. When the activator symbol is displayed, a processor of the gaming device determines the transformation probability associated with each of the symbols displayed within a display device and randomly determines which, if any, of the displayed symbols are to be transformed into functional symbols such as wild symbols based on the transformation probability of the displayed symbols.

In one embodiment, the gaming device includes a plurality of reels having a plurality of symbols. Each of the symbols has a transformation probability associated with that symbol. The plurality of reels also includes one or more activator symbols. A display device displays the plurality of reels. A player activates the reels using conventional control features of the gaming device. A plurality of the symbols on the reels are displayed within the display device. In addition, at certain times, an activator symbol is displayed within the display device. When the activator symbol is displayed, the processor determines the transformation probability of, or associated with, each of the symbols displayed within the display device. The processor then randomly determines which, if any, symbols will be transformed into functional symbols based on the transformation probability of each of the symbols, and transforms those symbols into functional symbols. In one embodiment, the symbols are transformed simultaneously and the processor determines whether the player has achieved any winning outcomes after transforming all of the appropriate

symbols. In one embodiment, the processor transforms the symbols into functional symbols successively. In this embodiment, the processor transforms a first symbol into a wild symbol and determines if the player has achieved any winning outcomes. The first symbol reverts back to its original 5 state and the processor transforms a second symbol into a wild symbol. The processor then determines if the player has achieved any winning outcomes based on the second transformation. In alternative embodiments, the symbols are transformed into other types of functional symbols such as credit values which the player receives, or additional primary or free game symbols or bonus 10 trigger symbols. In one preferred embodiment, the gaming device includes a graphical display that graphically illustrates the activator symbol causing the processor to transform the appropriate symbols into functional symbols.

In one alternative embodiment of the present invention, the transformation probability is associated with the activator symbol instead of the 15 other displayed symbols. When the activator symbol is displayed along with the symbols on the reels, the processor uses the transformation probability of the activator symbol to individually determine whether one or more of the symbols displayed will be transformed into functional symbols. The processor randomly determines which, if any, symbols are functional symbols based on 20 the transformation probability associated with the activator symbol and transforms those symbols into functional symbols.

In one alternative embodiment, the processor provides a visual indication to the player of which symbol or symbols will be transformed prior to transforming the symbol. This may be done in any suitable manner such as by 25 highlighting or shading symbols, or by using a pointer or by indicating a path.

In one embodiment, the display device may display a plurality of activator symbols. When this occurs, the processor determines the transformation probability of, or associated with, each of the symbols displayed with respect to each of the plurality of activator symbols displayed. The 30 processor may then randomly determine symbols to be transformed into functional symbols based on the transformation probability of each of the symbols and transform each of the symbols into functional symbols such as

wild symbols simultaneously or successively with respect to each of the activator symbols; and simultaneously or successively with respect to each of the symbols. If a particular symbol is transformed into a wild symbol or other functional symbol in association with more than one activator symbol, the  
5 processor may apply a multiplier to the value of the winning combination or the functional symbol in determining the award the player receives. Alternatively, the processor may employ the transformation probabilities associated with such activator symbols. The processor may also alternatively determine which activator symbol to employ as discussed below.

10 In another embodiment, one or more activators designate symbols for transformation until a condition occurs, at which point, the symbols that were designated for transformation by one or more of the activators are no longer designated for transformation.

A further alternative embodiment of the present invention includes more  
15 than one or multiple transformations of the same symbol based on multiple transformation probabilities. For instance, probabilities associated with more than one activator symbol displayed on the display device may be employed to determine if a symbol will be transformed multiple times. Alternatively, one or more symbols could have multiple associated transformation probabilities.  
20 Further alternatively, an activator symbol could cause multiple determinations of transformation for one or more symbols or groups of symbols.

It is therefore an advantage of the present invention to provide a gaming device having transformation probabilities associated with symbols wherein the transformation probabilities are used to determine whether the symbols  
25 transform into functional symbols.

Additional features and advantages of the present invention are described in, and will be apparent from, the following Detailed Description of the Invention and the figures.

## 30

## BRIEF DESCRIPTION OF THE FIGURES

Figs. 1A and 1B are perspective views of alternative embodiments of the gaming device of the present invention.

Figs. 2 is a schematic block diagram of the electronic configuration of one embodiment of the gaming device of the present invention.

Fig. 3 is a flow diagram of one method of one embodiment of the present invention.

5 Figs. 4A, 4B and 4C are front elevation views of a display device in which an activator symbol is displayed on a set of reels.

Figs. 5A, 5B and 5C are front elevation views of a display device in which an activator symbol is displayed on a set of reels.

10 Figs. 6A and 6B are front elevation views of a display device in which an activator symbol is displayed on a set of reels and symbols are transformed into functional symbols simultaneously.

Figs. 7A and 7B are front elevation views of a display device in which an activator symbol is displayed on a set of reels.

15 Figs. 8A, 8B, 8C, 8D and 8E are front elevation views of a display device in which an activator symbol is displayed on a set of reels and symbols are transformed into functional symbols.

Figs. 9A and 9B are front elevation views of a display device in which an activator symbol is displayed on a set of reels and symbols are transformed into functional symbols simultaneously.

20 Figs. 10A, 10B and 10C are front elevation views of a display device in which an activator symbol is displayed on a set of reels.

Figs. 11A, 11B and 11C are front elevation views of a display device in which a plurality of activator symbols are displayed on a set of reels.

25 Figs. 12A, 12B and 12C are front elevation views of a display device in which a plurality of activator symbols are displayed on a set of reels.

Figs. 13A and 13B are front elevation views of a display device in which a plurality of activator symbols are displayed on a set of reels.

Fig. 14 is a front elevation view of a display device in which a plurality of activator symbols are displayed on a set of reels.

30 Fig. 15 is a front elevation view of a display device in which a plurality of activator symbols are displayed on a set of reels.

## DETAILED DESCRIPTION OF THE INVENTION

## Gaming Device and Electronics

Referring now to the drawings, and in particular to Figs. 1A and 1B, gaming device 10a and gaming device 10b illustrate two possible cabinet styles and display arrangements and are collectively referred to herein as gaming device 10. The present invention includes the game, described below, being a stand alone game or a bonus or secondary game that coordinates with a base game. The gaming device 10 can be a slot machine having the controls, displays and features of a conventional slot machine, or another game such as a video card game such as poker. The player can operate the gaming device while standing or sitting. Gaming device 10 also includes being a pub-style or table-top game (not shown), which a player operates while sitting.

The gaming device 10 may include any bonus triggering events, bonus games as well as any progressive game coordinating with the base game. The symbols and indicia used for any of the base, bonus and progressive games include mechanical, electrical, electronic or video symbols and indicia.

In a standalone or a bonus embodiment, the gaming device 10 includes monetary input devices. Figs. 1A and 1B illustrate a coin slot 12 for coins or tokens and/or a payment acceptor 14 for cash money. The payment acceptor 14 also includes other devices for accepting payment, such as readers or validators for credit cards, debit cards or smart cards, tickets, notes, etc. When a player inserts money in gaming device 10, a number of credits corresponding to the amount deposited is shown in a credit display 16. After depositing the appropriate amount of money, a player can begin the game by pulling arm 18 or pushing play button 20. Play button 20 can be any play activator used by the player which starts any game or sequence of events in the gaming device.

As shown in Figs. 1A and 1B, gaming device 10 also includes a bet display 22 and a bet one button 24. The player places a bet by pushing the bet one button 24. The player can increase the bet by one credit each time the player pushes the bet one button 24. When the player pushes the bet one

button 24, the number of credits shown in the credit display 16 decreases by one, and the number of credits shown in the bet display 22 increases by one. The player may cash out by pushing the cash out button 26 to receive coins or tokens in the coin payout tray 28 or other forms of payment, such as an amount printed on a ticket or credited to a credit card, debit card or smart card.

Gaming device 10 also includes one or more display devices. The embodiment shown in Fig. 1A includes a central display device 30, and the alternative embodiment shown in Fig. 1B includes a central display device 30 as well as an upper display device 32. The display device includes any viewing surface such as glass, a video monitor or screen, a liquid crystal display or any other static or dynamic display mechanism. In a video poker, blackjack or other card gaming machine primary game embodiment, the display device includes displaying one or more cards.

The slot machine base game of gaming device 10 preferably displays a plurality of reels 34, preferably three to five reels 34, in mechanical or video form on one or more of the display devices. Each reel 34 displays a plurality of indicia such as bells, hearts, fruits, numbers, letters, bars or other images which preferably correspond to a theme associated with the gaming device 10. If the reels 34 are in video form, the display device displaying the video reels 34 is preferably a video monitor. Each base game, especially in the slot machine base game of the gaming device 10, includes speakers 36 for making sounds or playing music.

Referring now to Fig. 2, a general electronic configuration of the gaming device 10 for the standalone and bonus embodiments described above preferably includes: a processor 38; a memory device 40 for storing program code or other data; a central display device 30; an upper display device 32; a sound card 42; a plurality of speakers 36; and one or more input devices 44. The processor 38 is preferably a microprocessor or microcontroller-based platform which is capable of displaying images, symbols and other indicia such as images of people, characters, places, things and faces of cards. The memory device 40 includes random access memory (RAM) 46 for storing event data or other data generated or used during a particular game. The

memory device 40 also includes read only memory (ROM) 48 for storing program code, which controls the gaming device 10 so that it plays a particular game in accordance with applicable game rules and pay tables.

As illustrated in Fig. 2, the player preferably uses the input devices 44 to 5 input signals into gaming device 10. In the slot machine base game, the input devices 44 include the pull arm 18, play button 20, the bet one button 24 and the cash out button 26. A touch screen 50 and touch screen controller 52 are connected to a video controller 54 and processor 38. The terms "computer" or "controller" are used herein to refer collectively to the processor 38, the 10 memory device 40, the sound card 42, the touch screen controller and the video controller 54.

In certain instances, it is preferable to use a touch screen 50 and an associated touch screen controller 52 instead of a conventional video monitor display device. The touch screen enables a player to input decisions into the 15 gaming device 10 by sending a discrete signal based on the area of the touch screen 50 that the player touches or presses. As further illustrated in Fig. 2, the processor 38 is connected to the coin slot 12 or payment acceptor 14, whereby the processor 38 requires a player to deposit a certain amount of money in to start the game.

It should be appreciated that although a processor 38 and memory device 40 are preferable implementations of the present invention, the present invention also includes being implemented via one or more application-specific integrated circuits (ASIC's), one or more hard-wired devices, or one or more mechanical devices (collectively or alternatively referred to herein as a 20 "processor"). Furthermore, although the processor 38 and memory device 40 preferably reside in each gaming device 10 unit, the present invention includes providing some or all of their functions at a central location such as a network server for communication to a playing station such as over a local area network (LAN), wide area network (WAN), Internet connection, microwave link, 25 and the like.

With reference to the slot machine base game of Figs. 1A and 1B, to operate the gaming device 10, the player inserts the appropriate amount of

tokens or money in the coin slot 12 or the payment acceptor 14 and then pulls the arm 18 or pushes the play button 20. The reels 34 then begin to spin. Eventually, the reels 34 come to a stop. As long as the player has credits remaining, the player can spin the reels 34 again. Depending upon where the 5 reels 34 stop, the player may or may not win additional credits.

#### Symbols Having Transformation Probabilities

Fig. 3 provides an overview of a process or method 100 of one embodiment of the present invention. When the game begins, a plurality of reels are activated as indicated by block 102. A plurality of symbols are then 10 randomly generated and displayed by or within a display device as indicated by block 104. First, the processor determines conventional wins, if any. In one embodiment, upon a suitable triggering event, the processor of the gaming device determines the transformation probability of a first symbol displayed within the display device as indicated by block 106. Preferably, the 15 transformation probability is greater than or equal to zero and less than one. The transformation probability of the symbol is the probability that the symbol will be transformed into a wild symbol or other functional symbol such as a credit value. In one embodiment, the transformation probability is contained within a table that is stored within a memory device accessible or in 20 communication with the processor of the gaming device. The processor accesses the transformation probability associated with the appropriate symbol. Preferably, the transformation probability is different for one or more of the symbols. In one embodiment, each symbol or type of symbol such as BARS or cherries may have the same transformation probability for the same 25 type of symbol and different probabilities for different types of symbols. In one embodiment, the transformation probability depends on the position of the symbols relative to the activation symbol discussed below or another location such as the center of the reels.

Next, the processor determines whether to transform a first symbol 30 based on the transformation probability associated with that symbol, as indicated by block 108. This may be done by a random calculation or in some other suitable order. If randomly determined to be wild, the processor

transforms the symbol into a wild symbol or other functional symbol, as indicated by block 110. Then, the processor makes an evaluation to determine if there are any winning outcomes displayed within the display device, as indicated by block 112. As indicated by diamond 114, if the processor has 5 determined the transformation probability of all of the symbols and has performed random determinations for all of the symbols, the game ends; however, if the processor must still determine the transformation probability of other symbols and randomly determine whether those symbols are to be functional symbols, the processor again performs the steps indicated by blocks 10 106, 108 and 110 for each symbol. In one alternative embodiment, the game could provide a terminator or a terminating event which prevents further transformations. Once all appropriate symbols are transformed, the game ends.

In one embodiment, a display device 30 displays a plurality of reels 34a, 15 34b and 34c as illustrated in Fig. 4A. The reels include a plurality of symbols 68a through 68h. In this embodiment, the reels also include at least one activator symbol 70 which may be displayed within the display device. In Fig. 4A, the activator symbol 70 is displayed in a middle position of the second reel 34b. When the activator symbol is displayed within the display device, the 20 processor determines the transformation probability of, or associated with, each of one or more symbols displayed within the display device. In one example, the processor randomly determines that a symbol 68e in the middle position on the third reel will become a functional symbol, and more specifically, a wild symbol, based on the transformation probability of that 25 symbol. The processor then transforms that symbol into a wild symbol, which may be performed in any suitable manner. For example, in Fig. 4B, the activator symbol appears to shoot, or send a ray towards, or provide any other suitable indicator to the symbol 68e on the third reel 34c which is determined to be a wild symbol. In this embodiment, the symbol or symbols chosen to 30 become wild become wild symbols successively. The processor evaluates whether any winning outcomes occurred when the symbol 68e transformed into a wild symbol. Then, as shown in Fig. 4C, the activator symbol 70

appears to send a ray towards a second symbol 68a located in a top position of the first reel 34a which the processor has randomly determined to be a wild symbol based on the transformation probability associated with that symbol. The processor then evaluates whether the player has achieved any winning outcomes.

It should be appreciated that the processor can convey to a player that a symbol has been determined to be a functional symbol such as a wild symbol in any suitable manner. For example, in Fig. 5A, an activator symbol 70 is displayed in the middle position of the second reel 34b. The processor determines the transformation probability of each symbol 68a through 68h also displayed within the display device. The processor then randomly determines, for example, that the symbol 68c in the top position of the third reel 34c is a wild symbol based on the transformation probability of the symbol. The processor transforms the symbol in the top position of the third reel into a wild symbol 75a as shown in Fig. 5B. Next, the processor randomly determines that the symbol 68g in the bottom position of the second reel 34b is a wild symbol based on the transformation probability of that symbol. The processor transforms the symbol in the bottom position of the second reel into a wild symbol as shown in Fig. 5C. In an embodiment in which the reels are mechanical, backlighting or other lighting can be used to indicate transformation of symbols into functional symbols such as wild symbols.

In one alternative embodiment, the processor first determines which symbols will be transformed, then indicates the symbols to be transformed to the player, and then transforms the determined symbols in a suitable sequential or simultaneous fashion.

In one embodiment, the processor transforms each symbol determined to be a functional symbol in a simultaneous manner. For example, the display device displays a plurality of reels including a plurality of symbols as shown in Fig. 6A. An activator symbol 70 is displayed in the middle position of the first reel 34a. The processor determines the transformation probability of each of the symbols 68a through 68h displayed within the display device. The processor then randomly determines, for example, that the symbol 68b in the

top position of the second reel 34b, the symbol 68g in the bottom position of the second reel 34b and the symbol 68e in the middle position of the third reel 34c will become a functional symbol such as a wild symbol based on the transformation probability of each of these symbols. The processor transforms 5 these symbols into wild symbols simultaneously, as indicated in Fig. 6B.

In one embodiment, the symbols that are randomly determined to be functional symbols may only occupy specific positions of a reel, such as the top position or the bottom position of the first, second or third reel. For example, the display device displays a plurality of reels including a plurality of 10 symbols as shown in Fig. 7A. An activator symbol 70 is also displayed in the middle position of the second reel 34b. The processor determines the transformation probability of each of the symbols 68a, 68b and 68c in the top position of the first, second and third reels and each of the symbols 68f, 68g and 68h in the bottom position of the first, second and third reels. The 15 processor randomly determines certain symbols to be wild symbols based on the transformation probability associated with each of the symbols in the top or bottom position of the reels, as indicated in Fig. 7B. In this embodiment, the symbols are transformed simultaneously; however, the symbols may also be transformed successively or in any other manner.

20 In one embodiment, the processor evaluates the transformation probability of each of the symbols displayed within a display device and transforms certain symbols, if any, into other functional symbols, such as credit values which a player receives. For example, in Fig. 8A, a display device displays a plurality of reels including a plurality of symbols. An activator 25 symbol 70 is displayed in the top position of the first reel 34a. The processor determines the transformation probability of each symbol displayed within the display device. The processor then randomly determines that symbol 68c will be transformed into a credit value 73a, as shown in Figs. 8B and 8C, based on the transformation probability of that symbol. If the processor transforms 30 symbols into credit values successively, the symbol 68c that was transformed into a credit value may transform back into its original state and a second symbol 68h may be randomly determined to be transformed into a credit value

73b based on the transformation probability of that symbol, as shown in Figs. 8D and 8E. If the symbols are transformed into credit values simultaneously, the processor transforms those symbols as shown in Figs. 9A and 9B. In one embodiment, the credit values are randomly selected by the processor. In an alternative embodiment, the symbols when transformed into functional symbols provide additional primary games to the player. In another embodiment, the symbols when transformed into functional symbols become bonus trigger symbols which trigger bonus games in the gaming device.

In an alternative embodiment, a transformation probability is associated with the activator symbol and is used by the processor to randomly determine which, if any, symbols within the display device will be transformed into wild symbols or other functional symbols. For example, in Fig. 10A, a display device displays a plurality of symbols 68a through 68h on a plurality of reels and also displays an activator symbol 70 in the top position of the third reel. The processor determines the transformation probability of the activator symbol. In one embodiment, the processor accesses the transformation probability of the activator symbol from a table stored within a memory device which is in communication with the processor. The transformation probability of the activator symbol is used for each of the displayed symbols. For example, the processor randomly determines a symbol 68e to be a wild symbol based on the transformation probability of the activator symbol and transforms the symbol into a wild symbol, as shown in Fig. 10B. The processor then randomly determines a symbol 68g to be a wild symbol based on the transformation probability of the activator symbol and transforms the symbol into a wild symbol as shown in Fig. 10C. In an alternative embodiment, each symbol when transforming into a functional symbol becomes a credit value.

In one embodiment, a plurality of activator symbols are on the reels and may be present within the display device upon a random generation of said reels. When this occurs, the processor determines the transformation probability of each of the symbols displayed within the display device with respect to each of the plurality of activator symbols. The processor then

randomly determines which, if any, symbols will be transformed into functional symbols such as wild symbols based on the transformation probability of each of the symbols. This may be performed by a plurality of methods. For example, a first activator symbol 70b, such as that displayed in the top position 5 of the third reel 34c, as shown in Fig. 11A, may cause the processor to randomly determine a symbol 68c in the middle position of the second reel 34b is a wild symbol based on the transformation probability of the symbol and transform that symbol into a wild symbol. After the symbol has been transformed into a wild symbol, and the evaluation of any winning outcomes 10 has been performed, the processor then randomly determines a second symbol 68g in the bottom position of the third reel 34c to be wild based on the transformation probability of that symbol. The processor transforms that symbol into a wild symbol, as shown in Fig. 11B. The transformation is performed in association with the activator symbol 70b present in the top 15 position of the third reel. When all of the transformations associated with the activator symbol in the top position of the third reel have been performed, the transformations in association with the second activator symbol 70a may occur, as shown in Fig. 11C.

In an alternative embodiment, multiple activators displayed on the reels 20 changes, such as by increasing, the transformation probability associated with one or more of the activators or symbols.

In one embodiment, the transformations associated with a plurality of activator symbols may be performed alternatively with respect to the activator symbols and successively with respect to the symbols. For example, a display 25 device displays a plurality of reels including a plurality of symbols and also displays an activator symbol in the middle position of the first reel 34a as shown in Fig. 12A. The display device also displays an activator symbol 70b in the top position of the third reel 34c. The processor may first randomly determine a symbol 68c to be a wild symbol based on the transformation 30 probability associated with that symbol and transform that symbol into a wild symbol 70b in association with the activator symbol 70b in the top position of the third reel. The processor then randomly determines a symbol 68e to be a

wild symbol based on the transformation probability of that symbol and transforms that symbol into a wild symbol in association with the activator symbol 70a on the first reel 34a, as shown in Fig. 12B. Next, the processor randomly determines a symbol 68a to be a wild symbol based on the 5 transformation probability of that symbol and transforms the symbol into a wild symbol in association with the activator symbol 70b on the third reel, as shown in Fig. 12C.

In one embodiment, when a plurality of activator symbols are displayed on the reels, the processor transforms symbols into functional symbols 10 simultaneously with respect to the activator symbols, but successively with respect to the symbols. For example, in Fig. 13A, a display device displays a set of reels having a set of symbols and also displays an activator symbol 70a in the middle position of the first reel 34a and an activator symbol 70b in the top position of the third reel 34c. The processor randomly determines a 15 symbol 68c to be a wild symbol based on the transformation probability of that symbol in association with the activator symbol 70b on the third reel 34c. The processor also randomly determines a symbol 68e to be a wild symbol, based on the transformation probability of that symbol, in association with the activator symbol 70a on the first reel 34a. The processor then simultaneously 20 transforms symbols 68c and 68e into wild symbols. When evaluations are performed as to any winning outcomes, the processor randomly determines a symbol 68f to be a wild symbol based on the transformation probability of that symbol in association with the activator symbol 70b on the third reel. The processor also randomly determines a symbol 68b to be a wild symbol based 25 on the transformation probability of that symbol in association with the activator symbol 70a on the first reel. The processor then simultaneously transforms symbols 68f and 68b into wild symbols as shown in Fig. 13B. In one alternative embodiment, the symbols are designated for transformation, but are only transformed if the activator meets a condition for transformation. For 30 instance, one activator 70a could shoot another activator 70b such that only the symbols designated by activator 70a are transformed. Such determination could be randomly determined by the processor.

In one embodiment, the processor transforms symbols into functional symbols simultaneously with respect to the symbols and with respect to the activator symbols. For example, in Fig. 14, an activator symbol 70a is displayed in the middle position of the first reel 34a and a second activator symbol 70b is displayed in the top position of the third reel 34c. The processor randomly determines a plurality of symbols to be wild symbols, based on the transformation probabilities associated with those symbols and transforms those symbols into wild symbols with respect to each of the activator symbols. For example, the processor randomly determines symbols 68e and 68f to be wild symbols in association with activator symbol 70a and simultaneously determines symbols 68a, 68c and 68g to be wild symbols in association with activator symbol 70b.

In one embodiment, a plurality of activator symbols having transformation probabilities is displayed within the display device. When this occurs, the processor determines the transformation probabilities of each of the activator symbols and uses the transformation probabilities to randomly determine which, if any, of the symbols within the display device are transformed into functional symbols. The processor may transform the symbols either simultaneously or successively. The processor may transform a symbol based on the transformation probability of a first activator symbol within the plurality of activator symbols displayed and re-transform the symbol based on the transformation probability of a second activator symbol.

It should be appreciated that when a plurality of activator symbols are displayed on a display device, the processor may randomly determine a symbol to be transformed into a wild symbol or other functional symbol with respect to one or more of the activator symbols. Fig. 15 provides an example in which a symbol 68c in the middle position of the second reel 34b is randomly determined to be a wild symbol, based on the transformation probability of the symbol 68b, in association with both the activator symbol 70a on the first reel and the activator symbol 70b on the third reel. When this occurs, in one embodiment, any payout is modified by a modifier such as a multiplier. The multiplier may be randomly determined or predetermined. In

an alternative embodiment, when this occurs, the symbol turns into a credit value. The symbol could turn into any other award such as a bonus game or one or more free games.

It should be appreciated that the transformation probability may be  
5 different for each symbol on the reels and that the probability for a given symbol may vary during the course of the processor transforming other symbols. For example, a reel may include heart symbols, "7" symbols and BAR symbols. The heart symbols may have a higher transformation probability than the "7" symbols or the BAR symbols. In one embodiment,  
10 each of the symbols in a type of symbols may have a different transformation probability.

In a further embodiment of the present invention, the transformation probabilities may be associated with one or more locations on the display device. The locations may have the same probabilities or different  
15 probabilities. In this embodiment, it should be appreciated that the probabilities are accordingly not directly associated with the activators or the symbols. In a further alternative embodiment, the transformation probabilities may be randomly determined from a potential range of probabilities, could be selected from one or more pools or tables of probabilities or determined in any  
20 other suitable manner in conjunction with the game math.

In another embodiment of the present invention, certain activators are associated with certain symbols or groups of symbols, wherein the activators only activate certain symbols or groups of symbols. It should also be appreciated that the transformation probabilities may be associated with  
25 groups of symbols, and that different groups of symbols or locations could have different transformation probabilities.

A further embodiment of the present invention includes two or more activators which simultaneously determine which symbols are functional (or wild) with respect to each activator. In one embodiment, all of the determined  
30 symbols are transformed. In another embodiment, only one activator cause its corresponding determined symbols to be transformed for the player. The determination of which activator is chosen may be randomly or otherwise

suitably determined. For instance, the symbols transformed may be related to the activator symbol with more or less transformed symbols than the other activator.

In a further alternative embodiment, a symbol, once transformed could 5 remain wild for one or more other transformations. In another alternative embodiment, several, but not all symbols could be transformed simultaneously. In another alternative embodiment, only symbols in certain locations such as in certain rows may be transformed.

In an alternative embodiment of the present invention, the 10 transformation probability associated with the activator may decrease as the processor transforms the symbols. In a further alternative embodiment, the transformation probability associated with the activator may increase as the processor transforms the symbols. In a further alternative embodiment, the transformation probability associated with the activator increases to a 15 percentage greater than zero and less than one after the activator does not transform one or more of the symbols.

In a further alternative embodiment, the activator may move after an evaluation of a symbol. For instance, the activator may move to the location of 20 an evaluated symbol after that symbol is transformed or if the symbol is not transformed, at any time after the determination is made for that symbol. The activator may also continue to move until the activator reaches all of the locations of the symbols or reaches a terminating condition. In one embodiment, the terminating condition is the terminating symbol, a previously 25 transformed symbol or a boundary such as a row or column. It should also be appreciated that one or more of the activators could be associated with certain symbols or locations.

Although the foregoing embodiments spoke in terms of a transformation probability related to one or more symbols, one or more activators, one or more locations, and a number of previously transformed symbols, it should be 30 appreciated that the effective transformation probability could be a result of combining two or more of these factors in any mathematically acceptable way.

It should be understood that various changes and modifications to the

presently preferred embodiments described herein will be apparent to those skilled in the art. Such changes and modifications can be made without departing from the spirit and scope of the present invention and without diminishing its intended advantages. It is therefore intended that such changes and modifications be covered by the appended claims.

## CLAIMS

The invention is claimed as follows:

1. A gaming device comprising:

5 a display device;

a plurality of reels displayed by the display device;

a processor operable to control the reels;

a plurality of symbols on the reels;

a transformation probability associated with at least one of the symbols

10 on the reels; and

at least one activator symbol on the reels, wherein when the activator symbol is displayed by the display device, the processor randomly determines which, if any, of the other symbols displayed by the display device are transformed into functional symbols based on the transformation probability, if

15 any, associated with each of the symbols displayed by the display device.

2. The gaming device of Claim 1, wherein transformation probabilities are associated with a plurality of the symbols.

20 3. The gaming device of Claim 2, wherein one of the functional symbols is a wild symbol.

4. The gaming device of Claim 1, wherein a transformation probability is associated with each of the symbols.

25 5. The gaming device of Claim 4, wherein one of the functional symbols is a wild symbol.

6. The gaming device of Claim 1, wherein one of the functional symbols is a wild symbol.

30

7. The gaming device of Claim 1, wherein one of the functional symbols is a credit value.

8. The gaming device of Claim 1, wherein one of the functional symbols is a free primary game symbol.

9. The gaming device of Claim 1, wherein one of the functional symbols is a bonus trigger symbol.

10. The gaming device of Claim 1, wherein transformation probabilities are associated with a plurality of the symbols on the reels displayed by the display device.

10

11. The gaming device of Claim 1, wherein the transformation probability for a first symbol of the plurality of symbols is higher than a transformation probability for a second symbol of the plurality of symbols.

15

12. The gaming device of Claim 1, which includes a plurality of different types of symbols in the plurality of symbols, wherein a first type of symbol has a higher transformation probability than a transformation probability of a second type of symbol.

20

13. The gaming device of Claim 1, which includes a plurality of groups of symbols in the plurality of symbols, wherein a first group of symbols has a higher transformation probability than a transformation probability of a second group of symbols.

25

14. The gaming device of Claim 1, which includes a plurality of activator symbols on said reels.

30

15. The gaming device of Claim 12, wherein the plurality of activator symbols include a first activator symbol and a second activator symbol wherein said processor randomly determines which, if any, symbols displayed by the display device are transformed into functional symbols in association with the first activator symbol and the second activator symbol based on the

transformation probability, if any, associated with the displayed symbols when said first activator symbol and said second activator symbol are displayed by the display device.

5        16. The gaming device of Claim 15, wherein the processor transforms only the symbols associated with one of said first and second activator symbols determined to be transformed by the processor.

10      17. The gaming device of Claim 15, wherein the processor transforms symbols into functional symbols successively with respect to the first activator symbol and second activator symbol.

15      18. The gaming device of Claim 15, wherein the processor transforms symbols into functional symbols simultaneously with respect to the first activator symbol and second activator symbol.

19. The gaming device of Claim 15, wherein the processor transforms symbols into functional symbols successively with respect to each symbol.

20      20. The gaming device of Claim 15, wherein the processor transforms symbols into functional symbols simultaneously with respect to each symbol.

25      21. The gaming device of Claim 15, wherein if the processor determines that said symbol is to be transformed more than once based on the determinations made for the plurality of activator symbols, the processor transforms each symbol displayed by the display device one time.

30      22. The gaming device of Claim 21, wherein said symbol is transformed into a credit value.

23. The gaming device of Claim 21, wherein said symbol is transformed in a multiplier.

24. The gaming device of Claim 15, wherein the symbols to be 5 transformed are designated by the display device prior to such transformation.

25. The gaming device of Claim 15, wherein the processor transforms less than all of the symbols to be transformed based on a random event controlled by the processor.

10 26. The gaming device of Claim 25, wherein the random event includes an interaction between the activator symbols.

27. A gaming device comprising:

15 a processor;  
a plurality of reels controlled by the processor;  
a plurality of symbols on the reels; and  
a transformation probability equal to or greater than zero percent and  
less than one hundred percent associated with at least one of said symbols,  
20 wherein upon a triggering event, the processor randomly determines if at least  
one of said symbols is transformed into a wild symbol based on the  
transformation probability, if any, associated with said symbol.

28. The gaming device of Claim 27, which includes at least one  
25 activator symbol, wherein said triggering event occurs when said activator  
symbol is displayed to a player on the reels.

29. The gaming device of Claim 27, which includes transformation  
probabilities equal to or greater than zero percent and less than one hundred  
30 percent associated with each of a plurality of said symbols.

30. The gaming device of Claim 29, which includes at least one activator symbol, wherein said transformation probability for at least one of said symbols is increased when the activator symbol is displayed to a player.

5 31. The gaming device of Claim 27, wherein said plurality of symbols include a first symbol and a second symbol, wherein a transformation probability of the first symbol is higher than a transformation probability of the second symbol.

10 32. The gaming device of Claim 27, which includes a first activator symbol on said reels and a second activator symbol on said reels, wherein said processor randomly determines which, if any, symbols are transformed into wild symbols based on the transformation probability of said symbols on said reels displayed to a player in association with said first activator symbol  
15 and said second activator symbol when said first activator symbol and said second activator symbol are displayed to the player.

20 33. The gaming device of Claim 32, wherein the processor transforms symbols into wild symbols successively with respect to the first activator symbol and the second activator symbol.

34. The gaming device of Claim 32, wherein the processor transforms symbols into wild symbols simultaneously with respect to the first activator symbol and the second activator symbol.

25 35. The gaming device of Claim 32, which includes at least one multiplier, said multiplier associated with one of the symbols if said symbol is determined to be transformed in association with said first activator symbol and said second activator symbol.

30 36. The gaming device of Claim 32, which includes at least one credit value, said credit value associated with one of the symbols if said

symbol is determined to be transformed in association with said first activator symbol and said second activator symbol.

37. The gaming device of Claim 32, wherein the symbols to be  
5 transformed are designated by the display device prior to such transformation.

38. The gaming device of Claim 32, wherein the processor transforms less than all of the symbols determined to be transformed based on a random event.

10 39. The gaming device of Claim 38, wherein the random event includes an interaction between the activator symbols.

40. A gaming device comprising:

15 a processor;  
a plurality of reels controlled by the processor;  
a plurality of symbols on the reels; and  
a plurality of transformation probabilities associated with a plurality of  
said symbols, wherein upon a triggering event, the processor randomly  
20 determines if each of said symbols having an associated transformation  
probability is transformed into a functional symbol based on said  
transformation probability associated with said symbol.

41. The gaming device of Claim 40, wherein one of the functional  
25 symbols is a credit value.

42. The gaming device of Claim 40, wherein one of the functional  
symbols is a free primary game symbol.

30 43. The gaming device of Claim 40, wherein one of the functional  
symbols is a bonus trigger symbol.

44. The gaming device of Claim 40, which includes at least one activator symbol, wherein said triggering event is said activator displayed on the reels to a player.

5       45. The gaming device of Claim 40, which includes a first activator symbol on said reels and a second activator symbol on said reels, wherein the processor randomly determines which, if any, symbols are transformed into functional symbols in association with said first activator symbol and said second activator symbol based on the transformation probability of said 10 symbols displayed on the reels when said first activator symbol and said second activator symbol are displayed to a player.

15      46. A gaming device comprising:  
          a processor;  
          a plurality of reels controlled by the processor;  
          a plurality of symbols on the reels;  
          at least one activator symbol on the reels; and  
          a transformation probability associated with said activator symbols, wherein upon a triggering event including said activation symbol displayed to a 20 player, the processor randomly determines if at least one of the symbols displayed to the player is transformed into a functional symbol based on the transformation probability associated with said activator symbol.

25      47. The gaming device of Claim 46, wherein said functional symbol is a credit value.

48. The gaming device of Claim 46, wherein said functional symbol is a free primary game symbol.

30      49. The gaming device of Claim 46, wherein said functional symbol is a bonus trigger symbol.

50. The gaming device of Claim 46, wherein the transformation probability associated with the activator symbol varies in at least two different activations of the reels.

5 51. The gaming device of Claim 46, wherein the transformation probability associated with the activator symbol decreases as each symbol displayed to the player is transformed into a functional symbol.

10 52. The gaming device of Claim 46, wherein the transformation probability associated with the activator symbol increases as each symbol displayed on the display device is transformed into a functional symbol.

15 53. The gaming device of Claim 46, wherein the transformation probability associated with the activator symbol is greater than zero after the activator symbol does not transform one of the symbols displayed to the player.

20 54. The gaming device of Claim 46, which includes a plurality of activator symbols on said reels and a transformation probability associated with each activator symbol.

55. The gaming device of Claim 46, wherein the processor randomly evaluates one of the symbols adjacent to the activator symbol and then moves the activator symbol to a location on the reels of the evaluated symbol.

25 56. The gaming device of Claim 55, wherein the activator symbol continues to move to location on the reels of the evaluated symbols until the activator symbol reaches a terminating condition.

30 57. The gaming device of Claim 56, wherein the terminating condition is selected from the group consisting of a terminator symbol, a previously transformed symbol, and a boundary.

58. The gaming device of Claim 46, wherein when a plurality of said activator symbols are displayed to the player, the processor transforms symbols into functional symbols successively with respect to each of the displayed activator symbols.

5

59. The gaming device of Claim 46, wherein when a plurality of said activator symbols are displayed by to the player, the processor transforms symbols into functional symbols simultaneously with respect to each of the activator symbols.

10

60. A gaming device comprising:  
a display device; and  
a processor operable to communicate with said display device, said processor and said display device operable to:

15

(a) activate a plurality of reels;  
(b) display a plurality of symbols on said reels;  
(c) access a transformation probability from a table stored within a memory device in communication with said processor; and  
(d) determine whether a symbol on said reels will be transformed

20 into a functional symbol based on said transformation probability.

61. A gaming device comprising:  
a plurality of reels;  
a plurality of symbols on said reels;  
a display device operable to display the symbols on the reels in a plurality of locations;  
a processor operable to control the display device and the reels;  
a transformation probability associated with at least one of the locations;  
and  
at least one activator symbol on said reels, wherein when the activator symbol is displayed on the reels by the display device, the processor randomly determines which, if any, of the symbols are transformed into functional

symbols based on the transformation probability, if any, associated with the locations of the symbols displayed at said locations by the display device.

62. The gaming device of Claim 61, wherein transformation  
5 probabilities are associated with a plurality of the locations.

63. The gaming device of Claim 62, wherein one of the functional symbols is a wild symbol.

10 64. The gaming device of Claim 61, wherein a transformation probability is associated with each of the locations.

65. The gaming device of Claim 64, wherein one of the functional symbols is a wild symbol.

15 66. The gaming device of Claim 61, wherein one of the functional symbols is a wild symbol.

67. The gaming device of Claim 61, wherein one of the functional  
20 symbols is a credit value.

68. The gaming device of Claim 61, wherein one of the functional symbols is a free primary game symbol.

25 69. The gaming device of Claim 61, wherein one of the functional symbols is a bonus trigger symbol.

70. The gaming device of Claim 62, wherein the transformation probability for a first location is higher than a transformation probability for a  
30 second location.

71. The gaming device of Claim 62, which includes a plurality of groups of locations, wherein a first group of locations has a higher transformation probability than a transformation probability of a second group of locations.

5

72. The gaming device of Claim 61, which includes a plurality of activator symbols on said reels.

73. The gaming device of Claim 72, which includes a first activator symbol and a second activator symbol within the plurality of activator symbols, wherein said processor randomly determines which, if any symbols displayed by the display device, are transformed into functional symbols in association with the first activator symbol and the second activator symbol based on the transformation probability, if any, associated with the locations of the displayed symbols when said first activator symbol and said second activator symbol are displayed by the display device.

74. The gaming device of Claim 73, wherein the processor transforms only the symbols associated with one of said first and second activator symbols determined to be transformed by the processor.

75. The gaming device of Claim 73, wherein the processor transforms symbols into functional symbols successively with respect to the first activator symbol and second activator symbol.

25

76. The gaming device of Claim 73, wherein the processor transforms symbols into functional symbols simultaneously with respect to the first activator symbol and second activator symbol.

30

77. The gaming device of Claim 73, wherein the processor transforms symbols into functional symbols successively with respect to each symbol.

78. The gaming device of Claim 73, wherein the processor transforms symbols into functional symbols simultaneously with respect to each symbol.

5 79. The gaming device of Claim 73, wherein if the processor determines that said symbol is to be transformed more than once based on the determinations made for the plurality of activator symbols, the processor transforms each symbol displayed by the display device one time.

10 80. The gaming device of Claim 79, wherein said symbol is transformed into a credit value.

81. The gaming device of Claim 79, wherein said symbol is transformed in a multiplier.

15 82. The gaming device of Claim 73, wherein the symbols to be transformed are designated by the display device prior to such transformation.

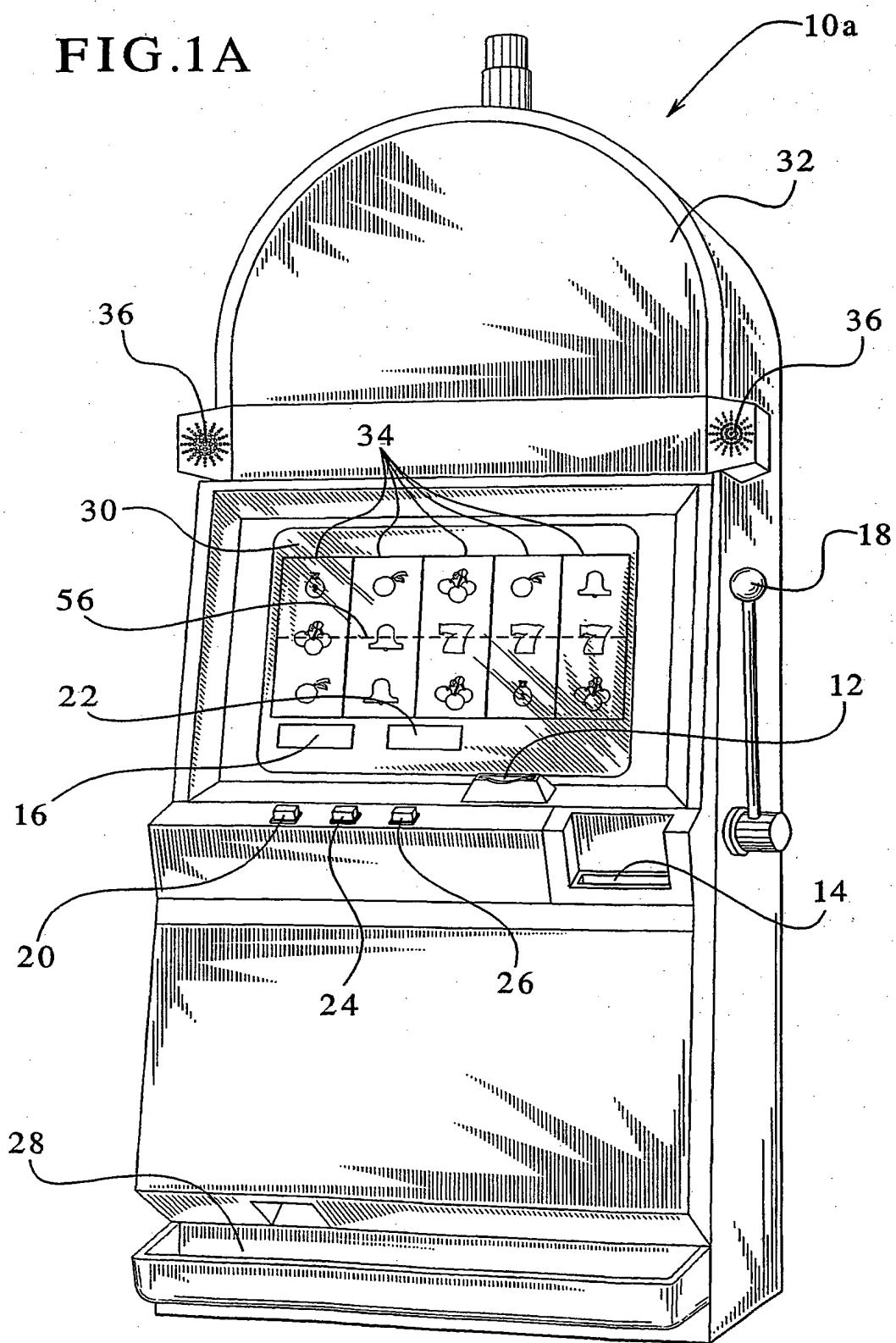
20 83. The gaming device of Claim 73, wherein the processor transforms less than all of the symbols to be transformed based on a random event controlled by the processor.

84. The gaming device of Claim 73, wherein the random event includes an interaction between the activator symbols.

25

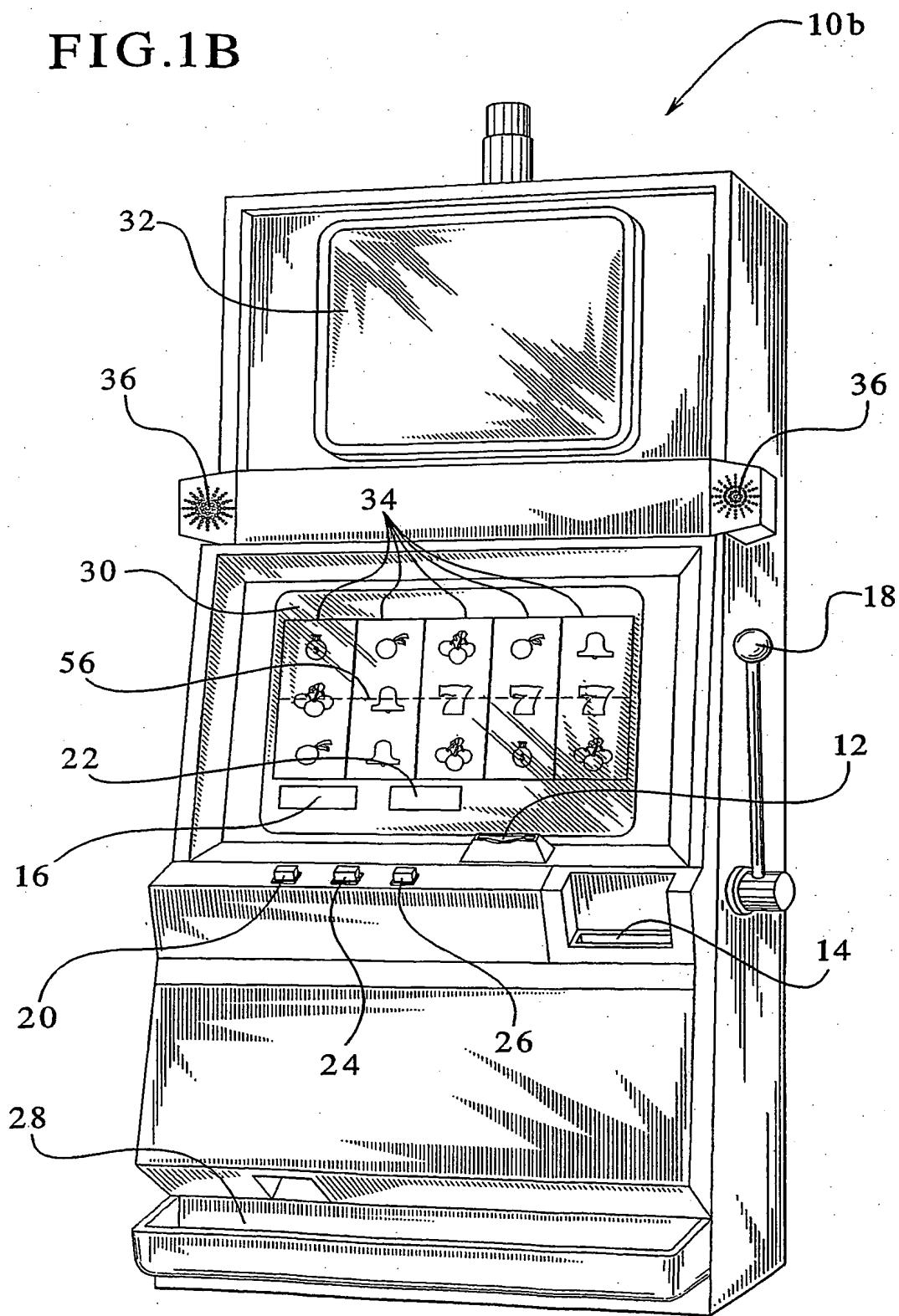
1/19

FIG.1A



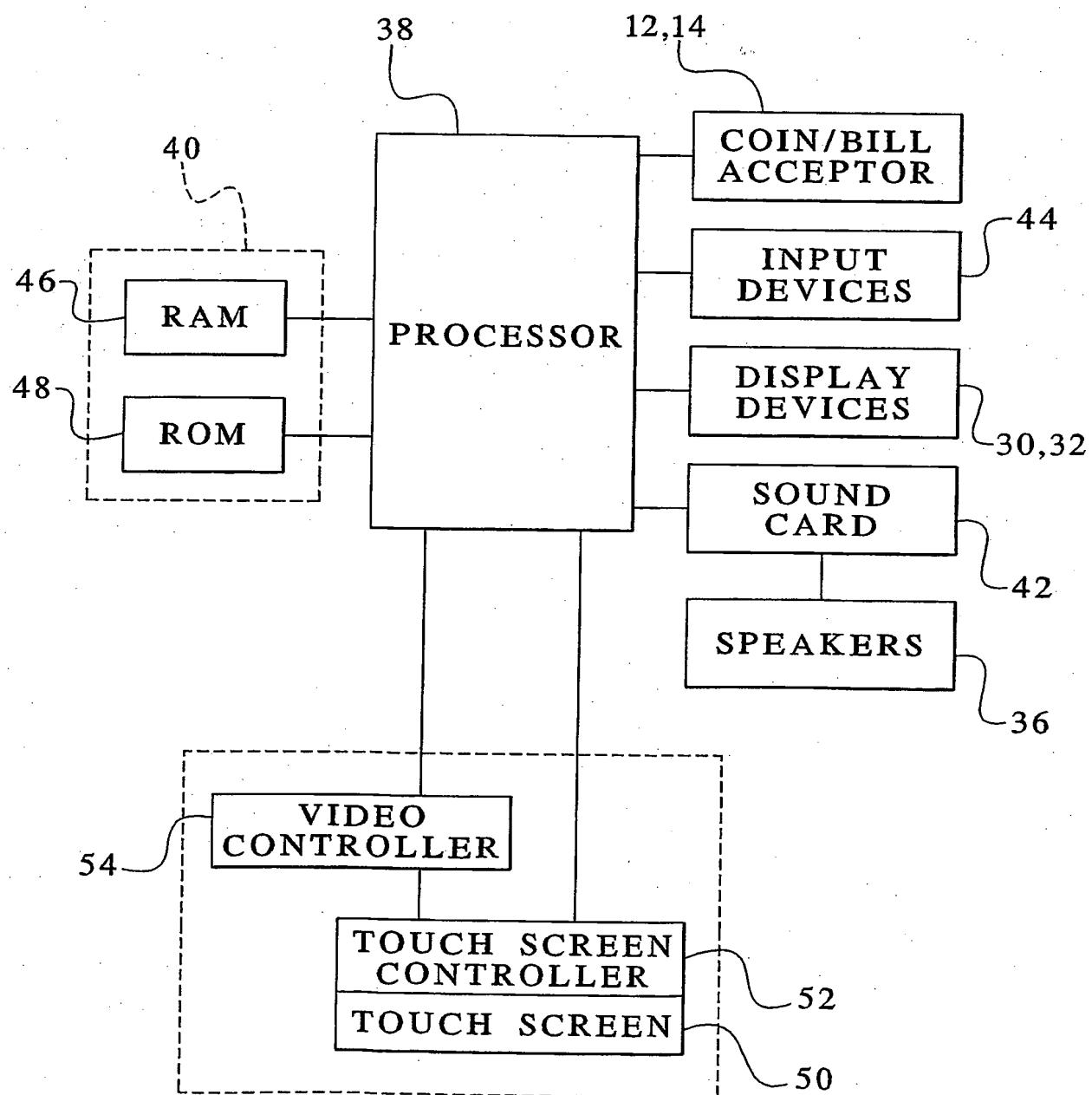
2/19

FIG.1B



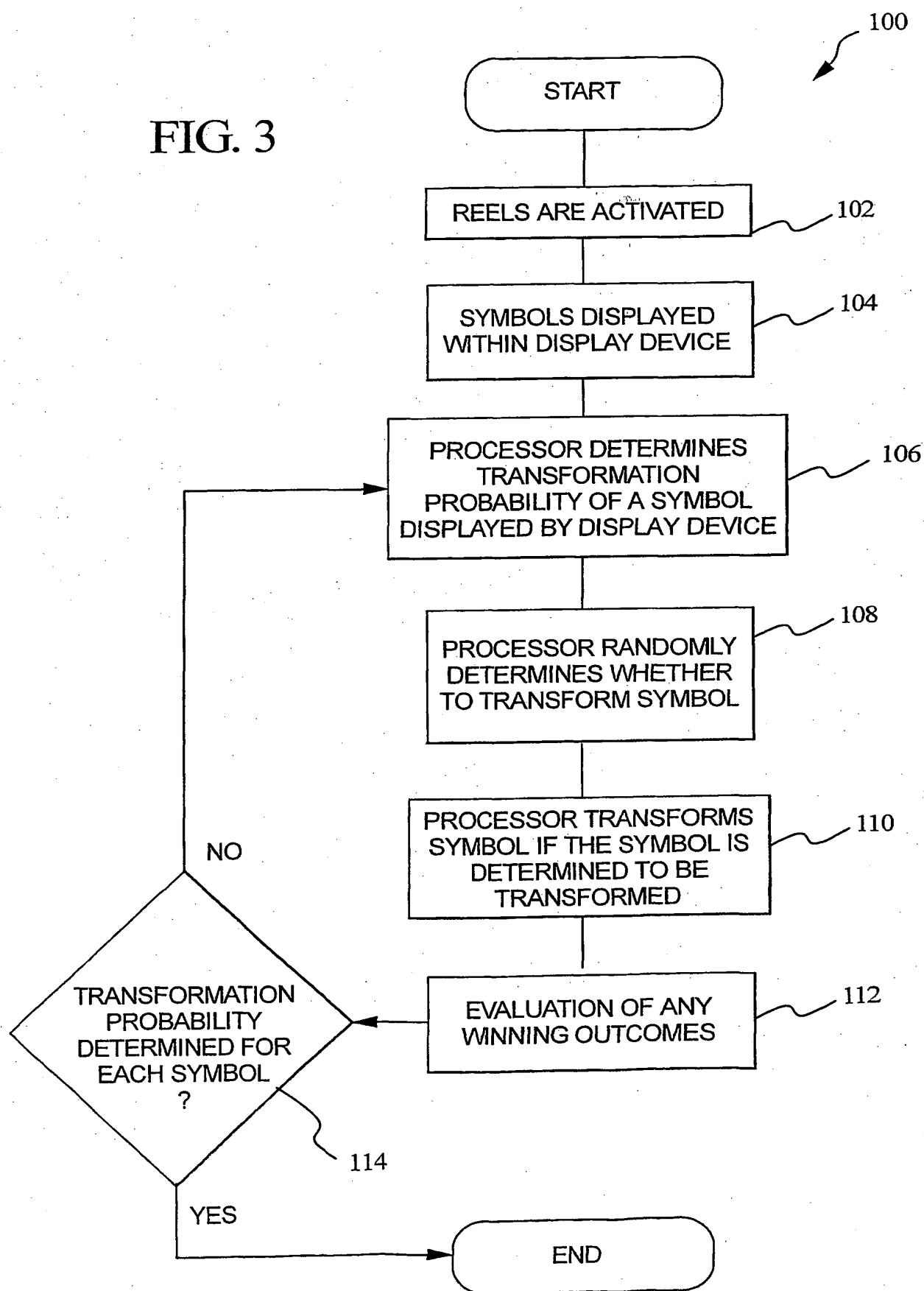
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FIG.2



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FIG. 3



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FIG. 4A

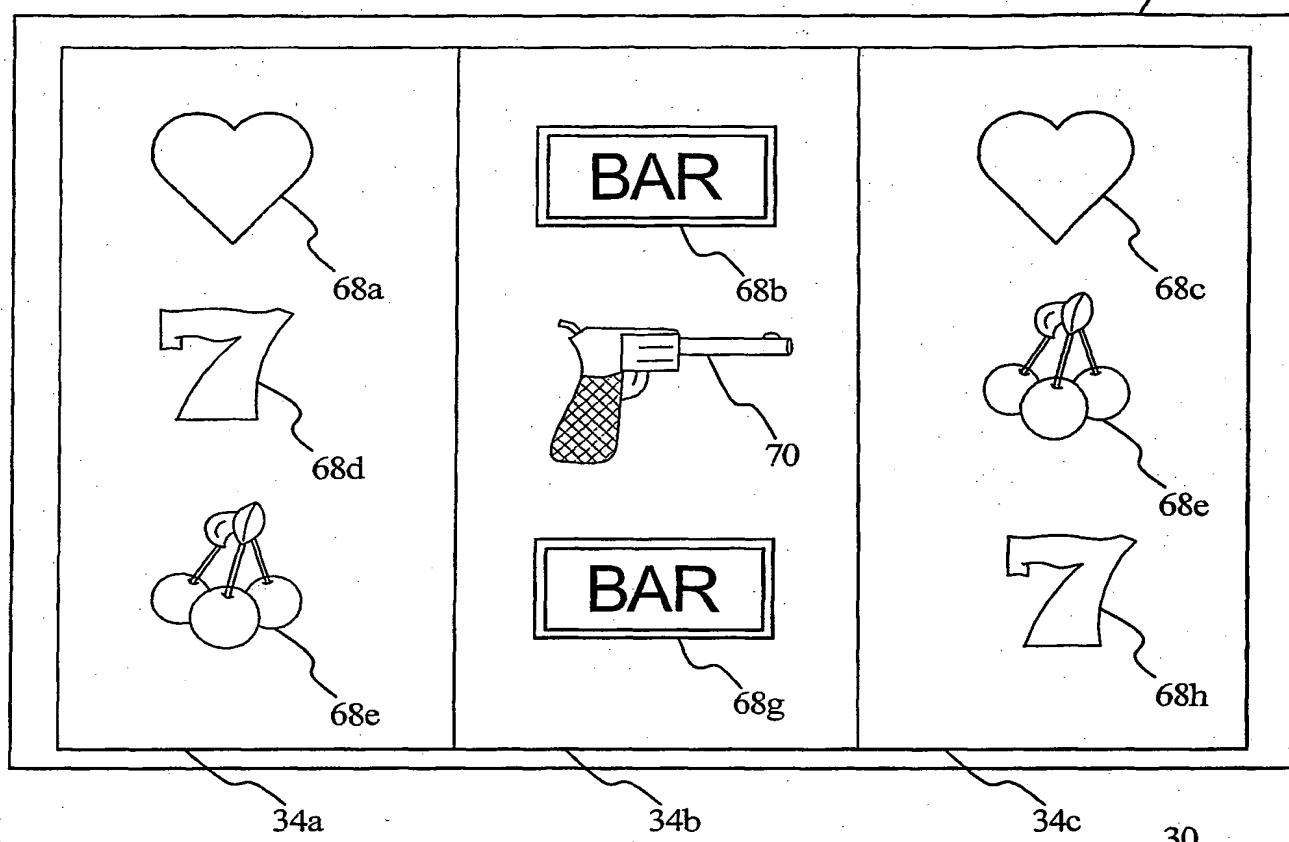
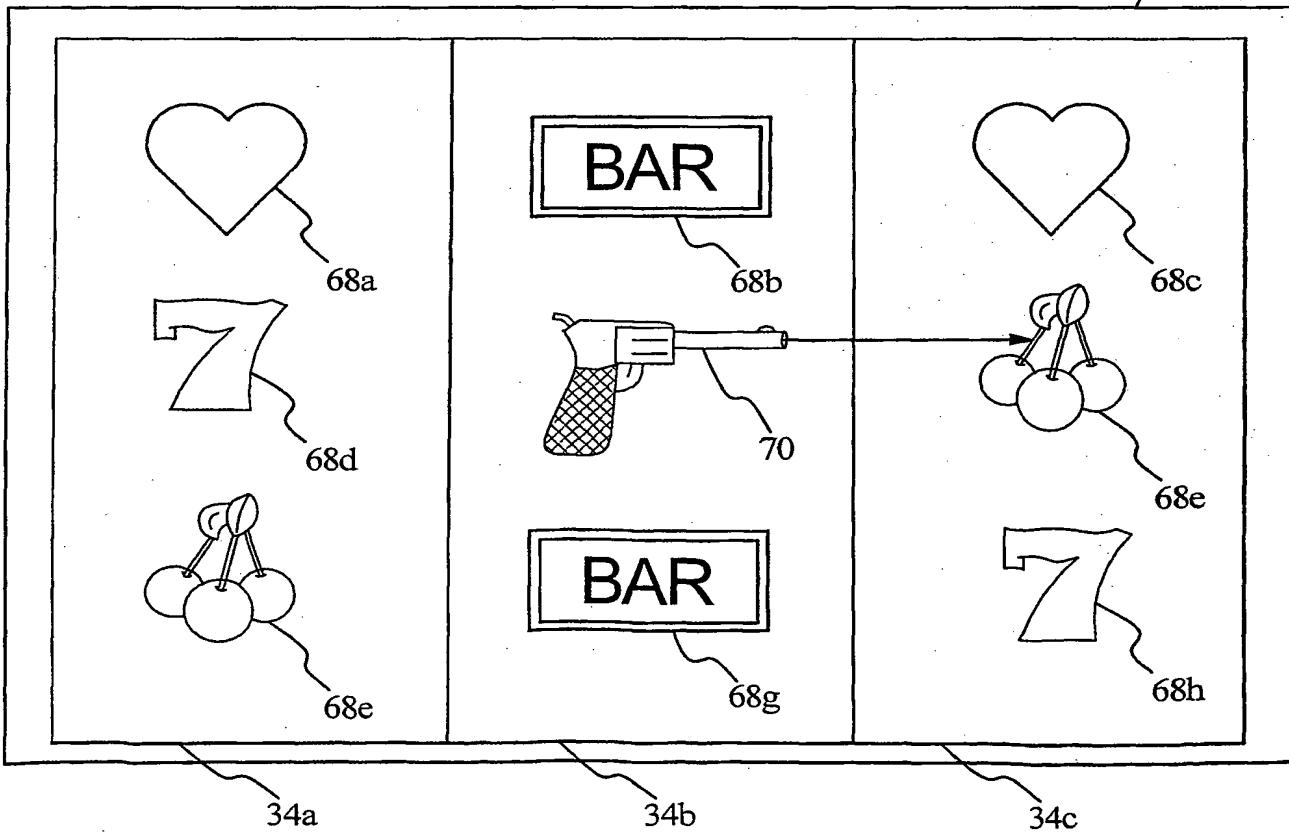


FIG. 4B



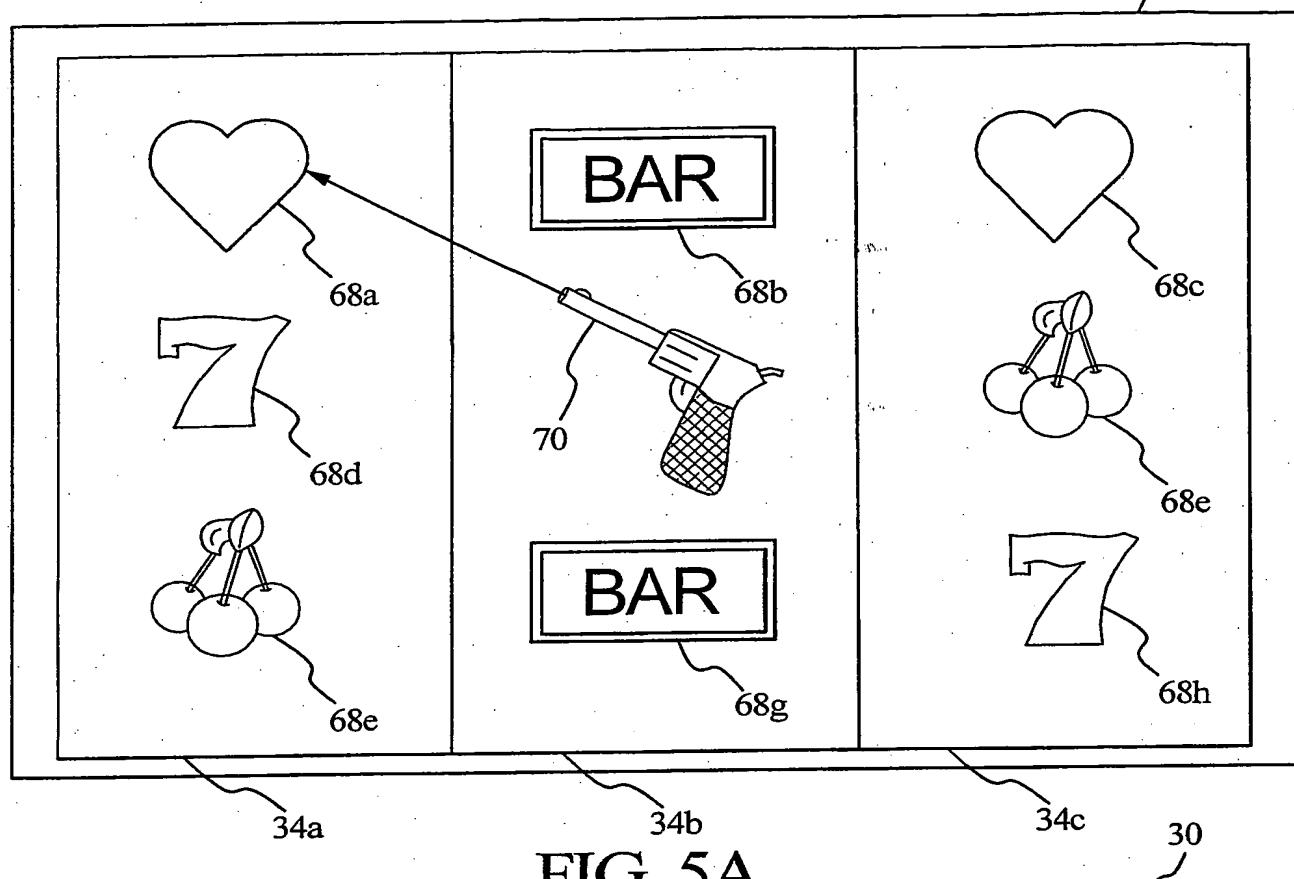
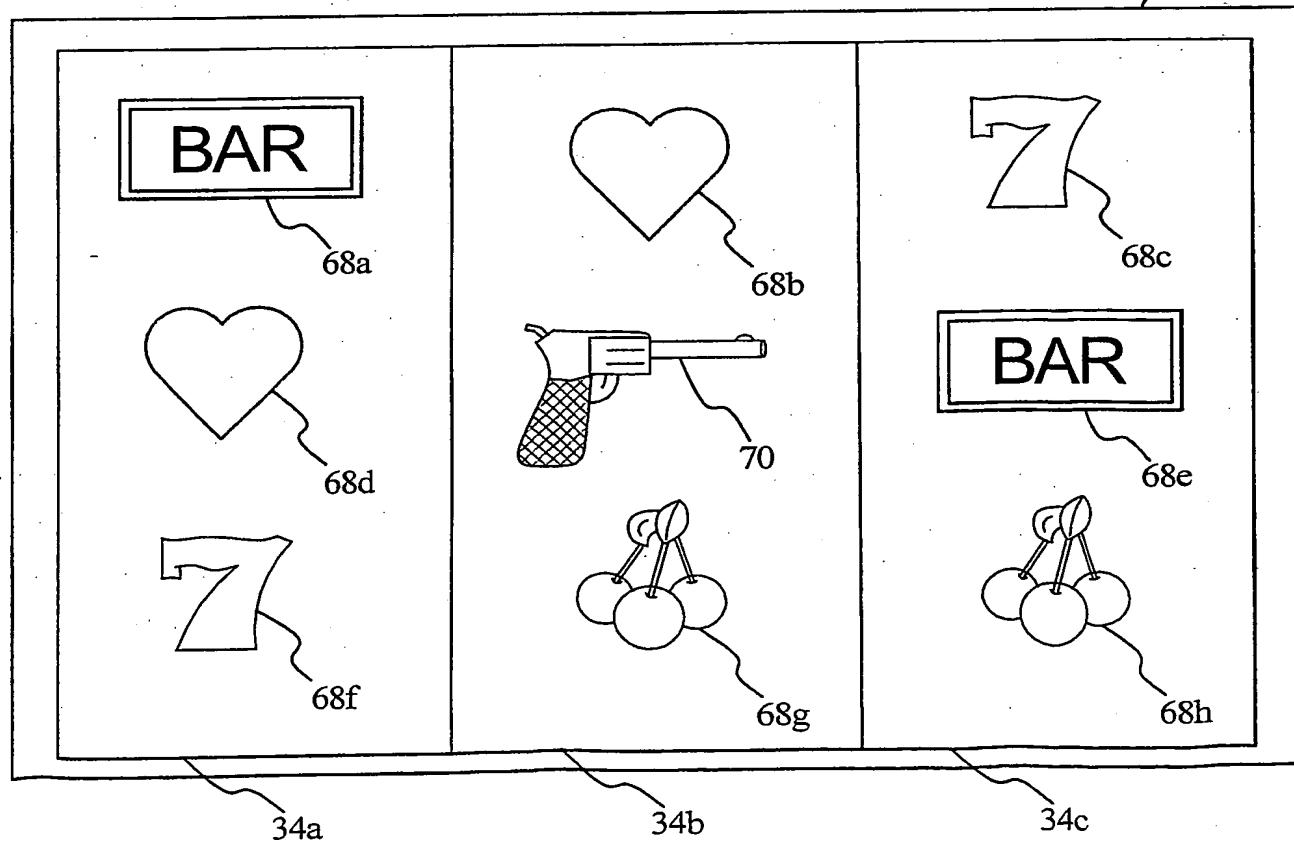
6/19  
FIG. 4C

FIG. 5A



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FIG. 5B

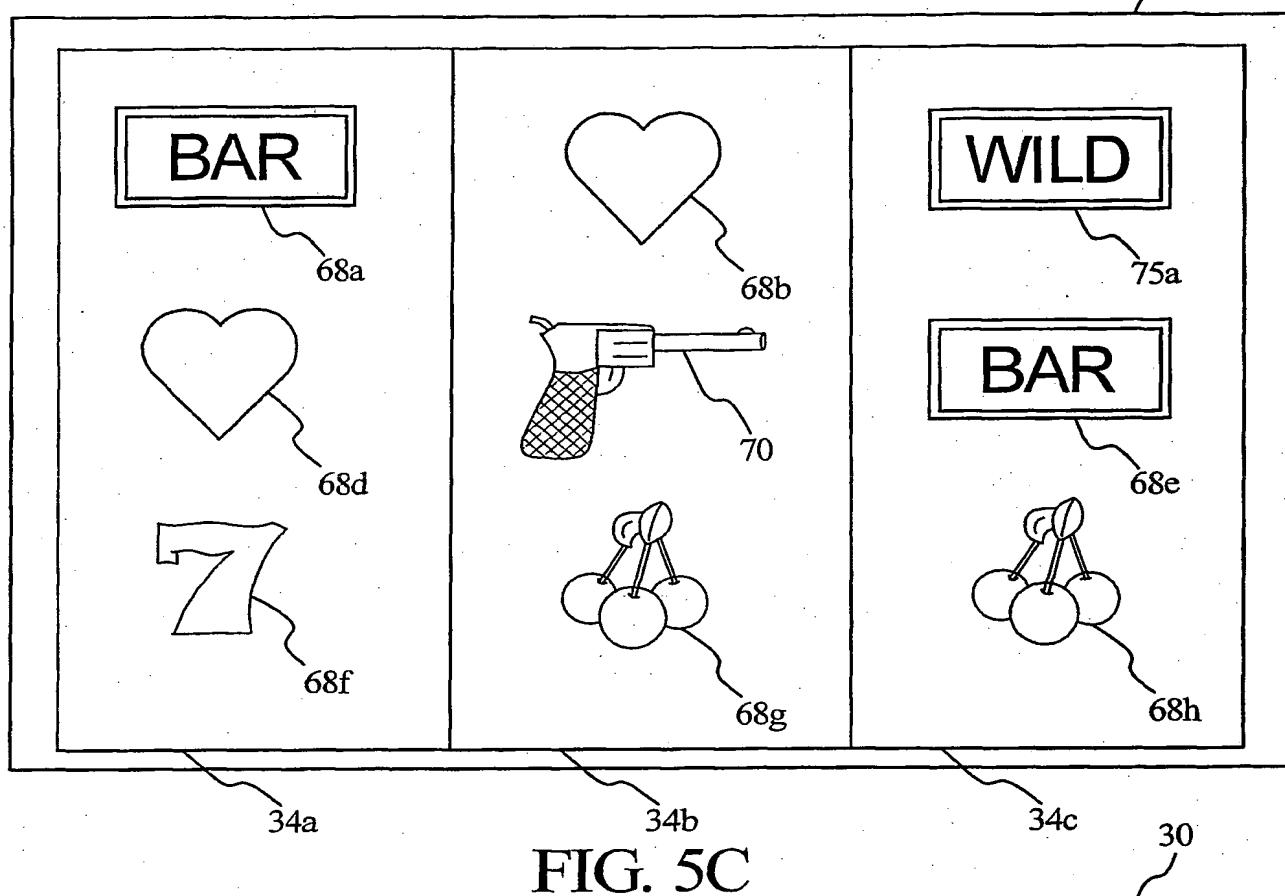
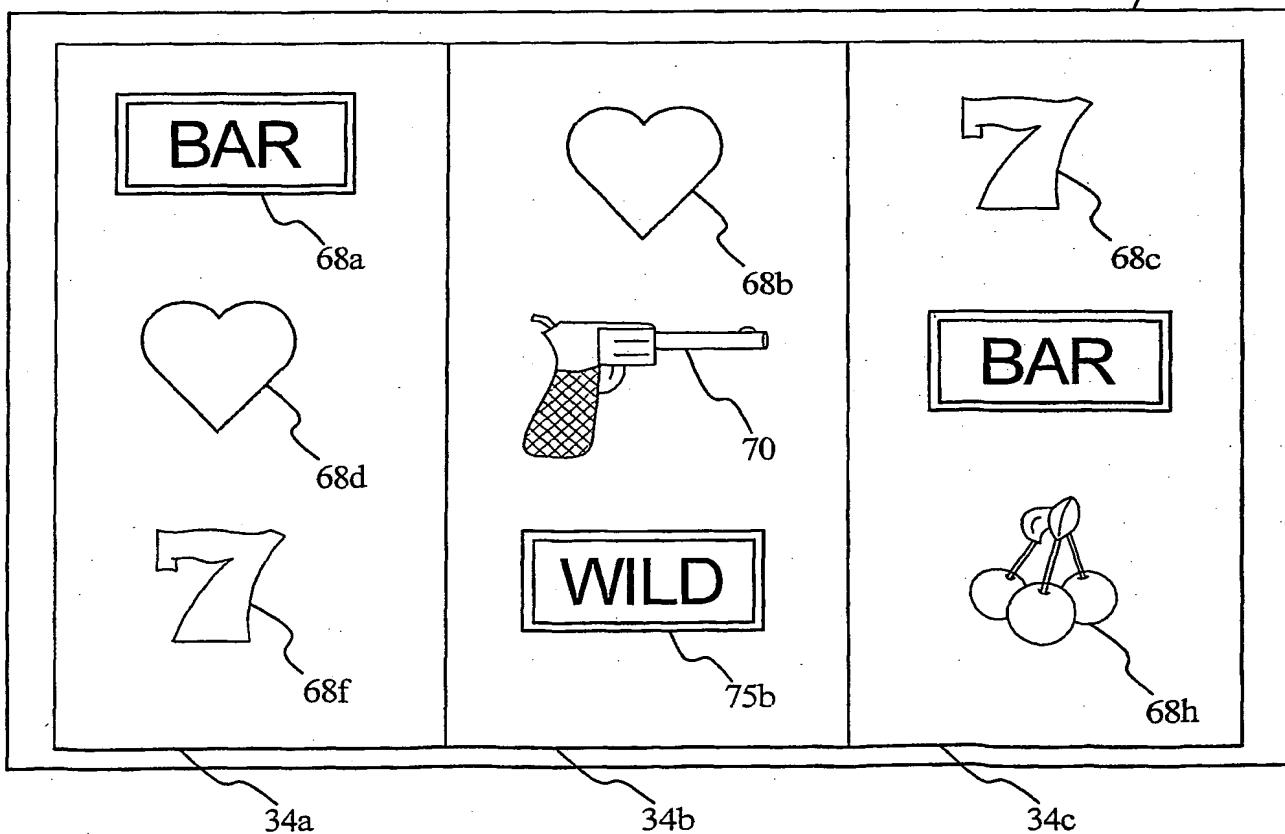


FIG. 5C



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FIG. 6A

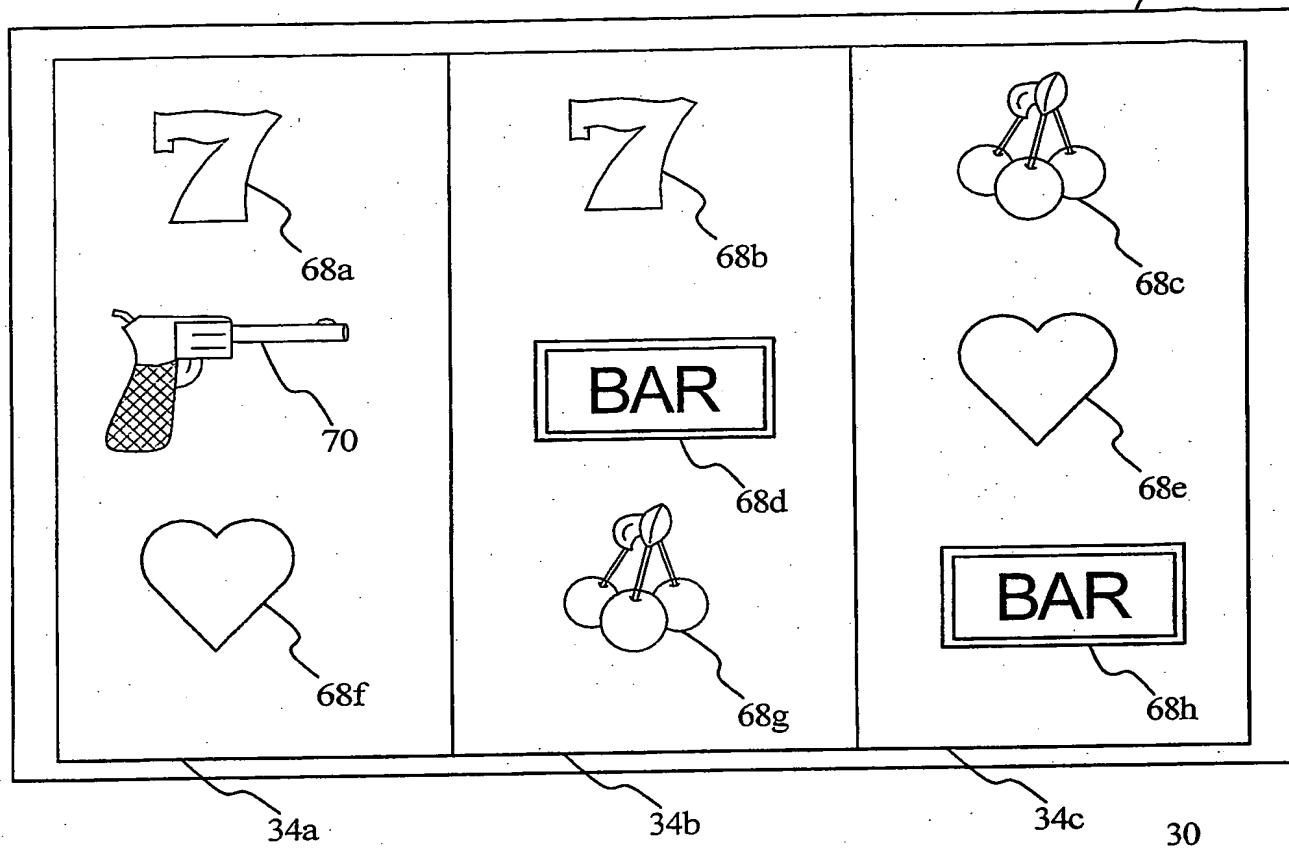
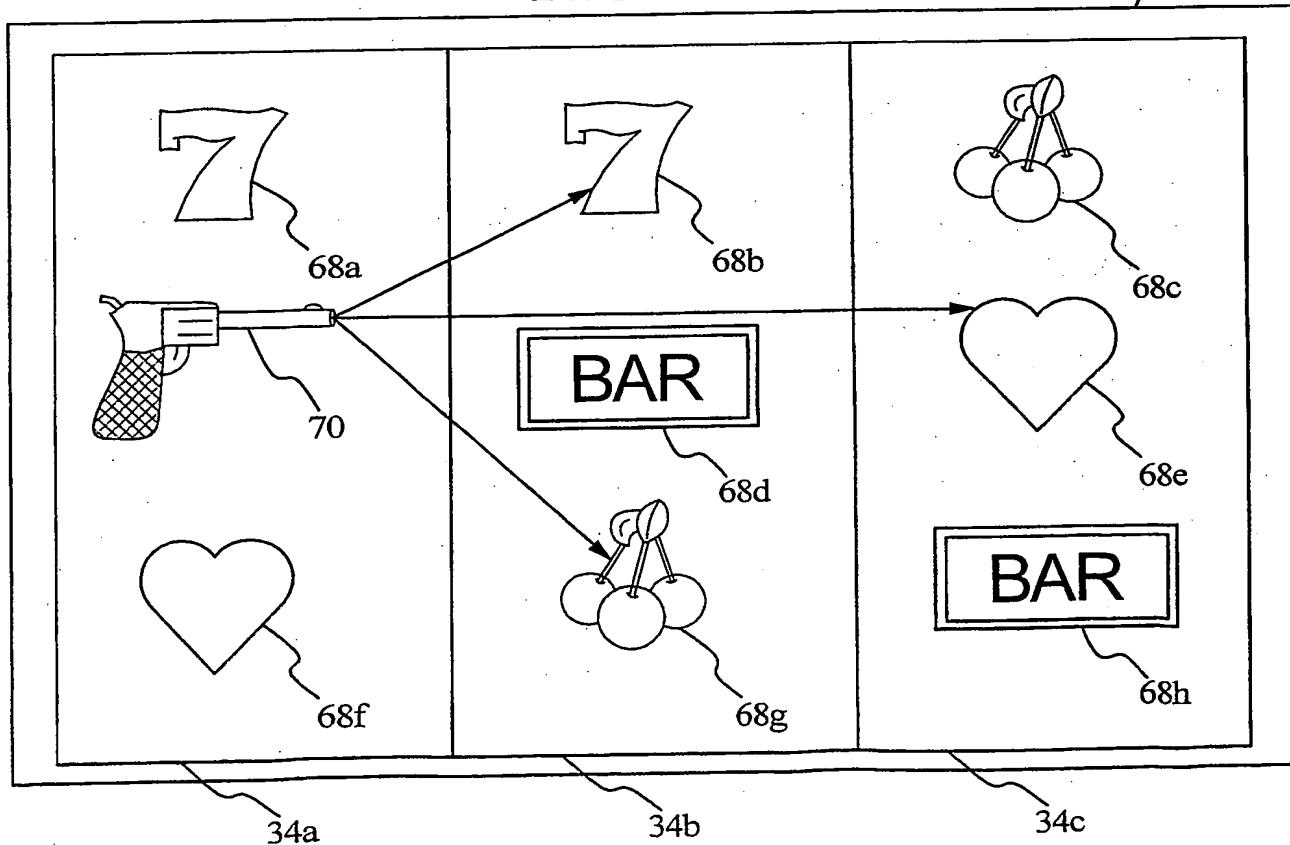


FIG. 6B



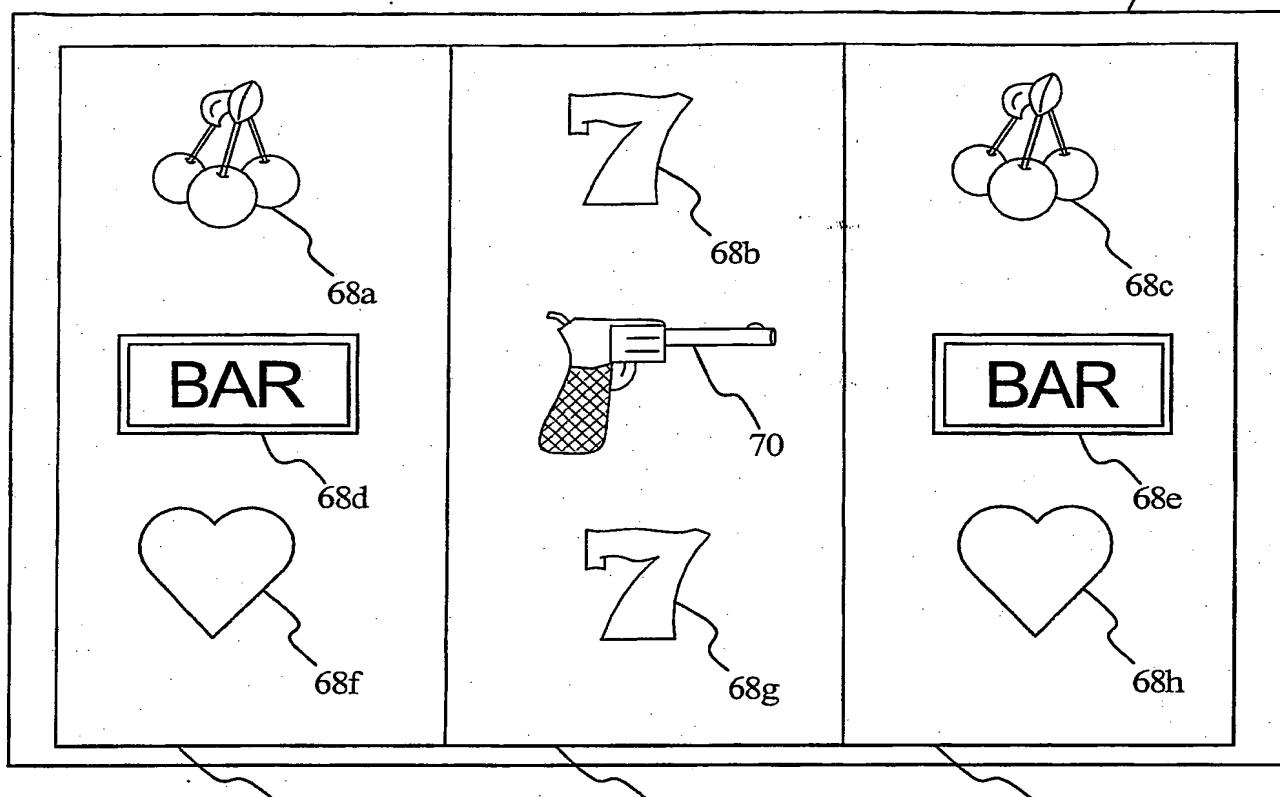
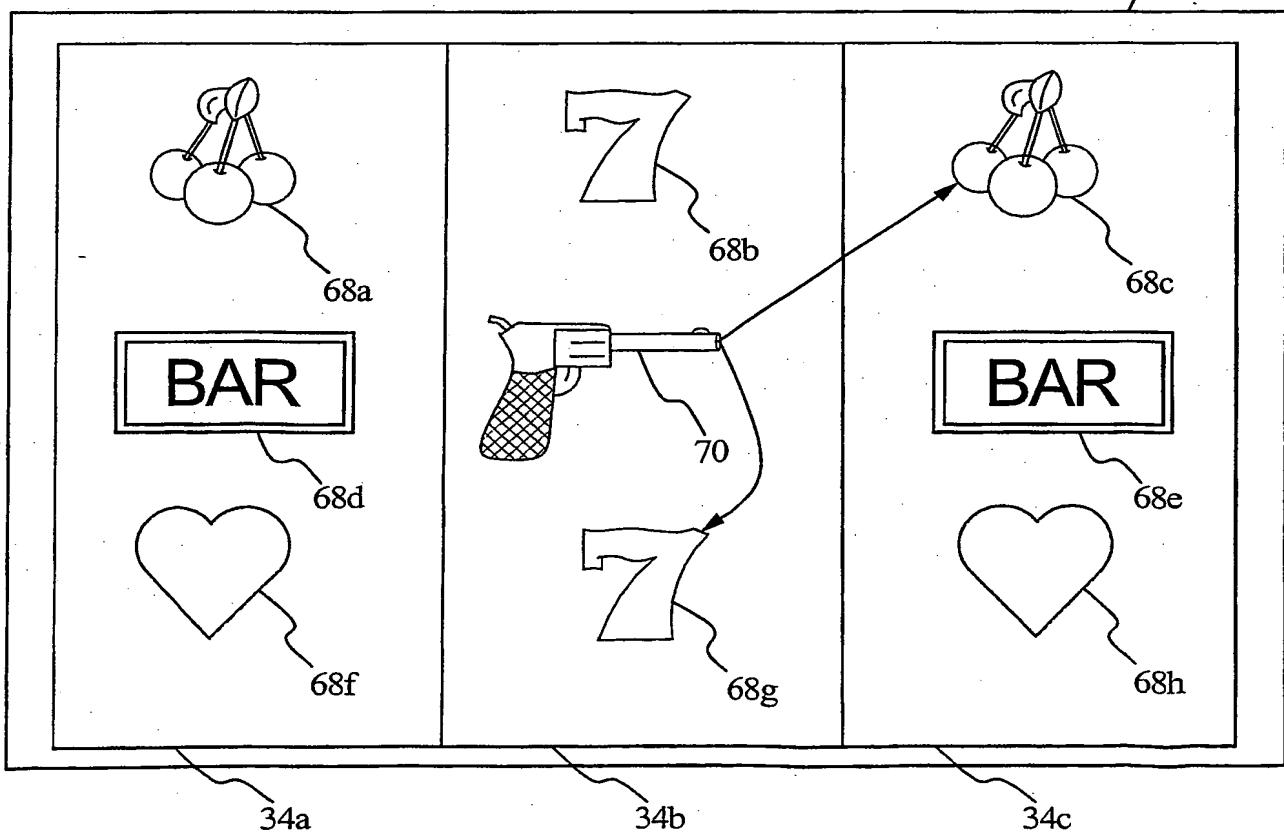
9/19  
FIG. 7A

FIG. 7B



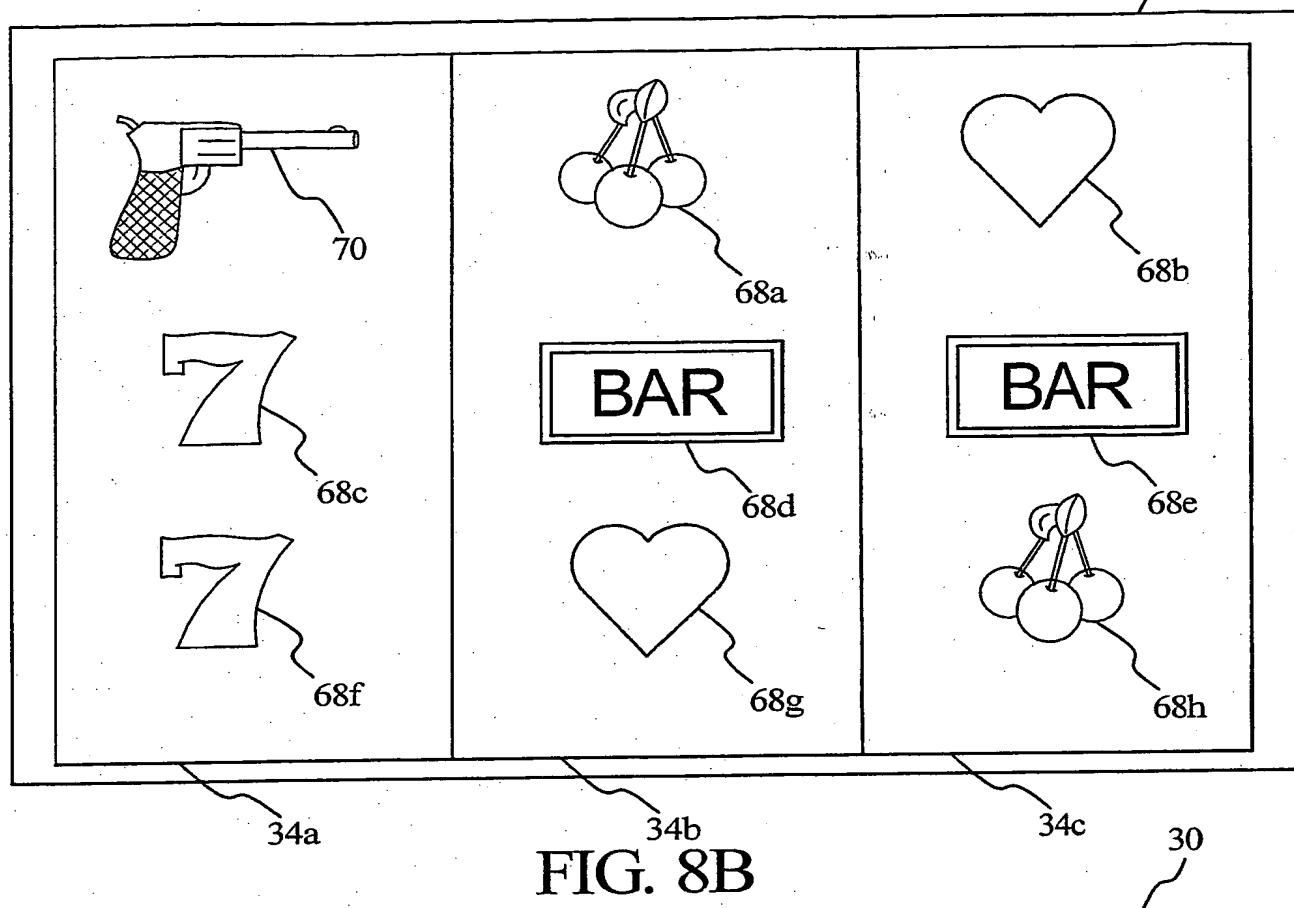
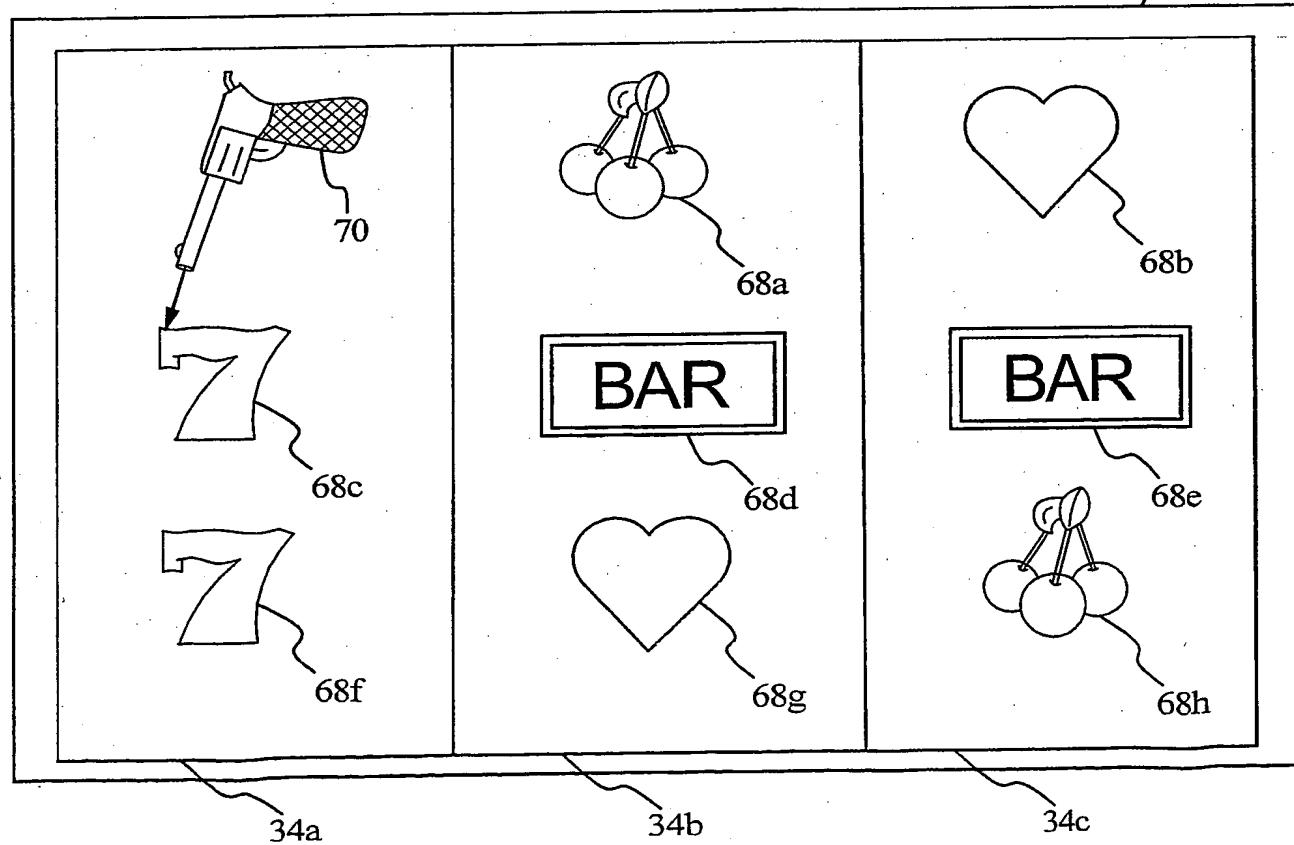
10/19  
FIG. 8A

FIG. 8B



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FIG. 8C

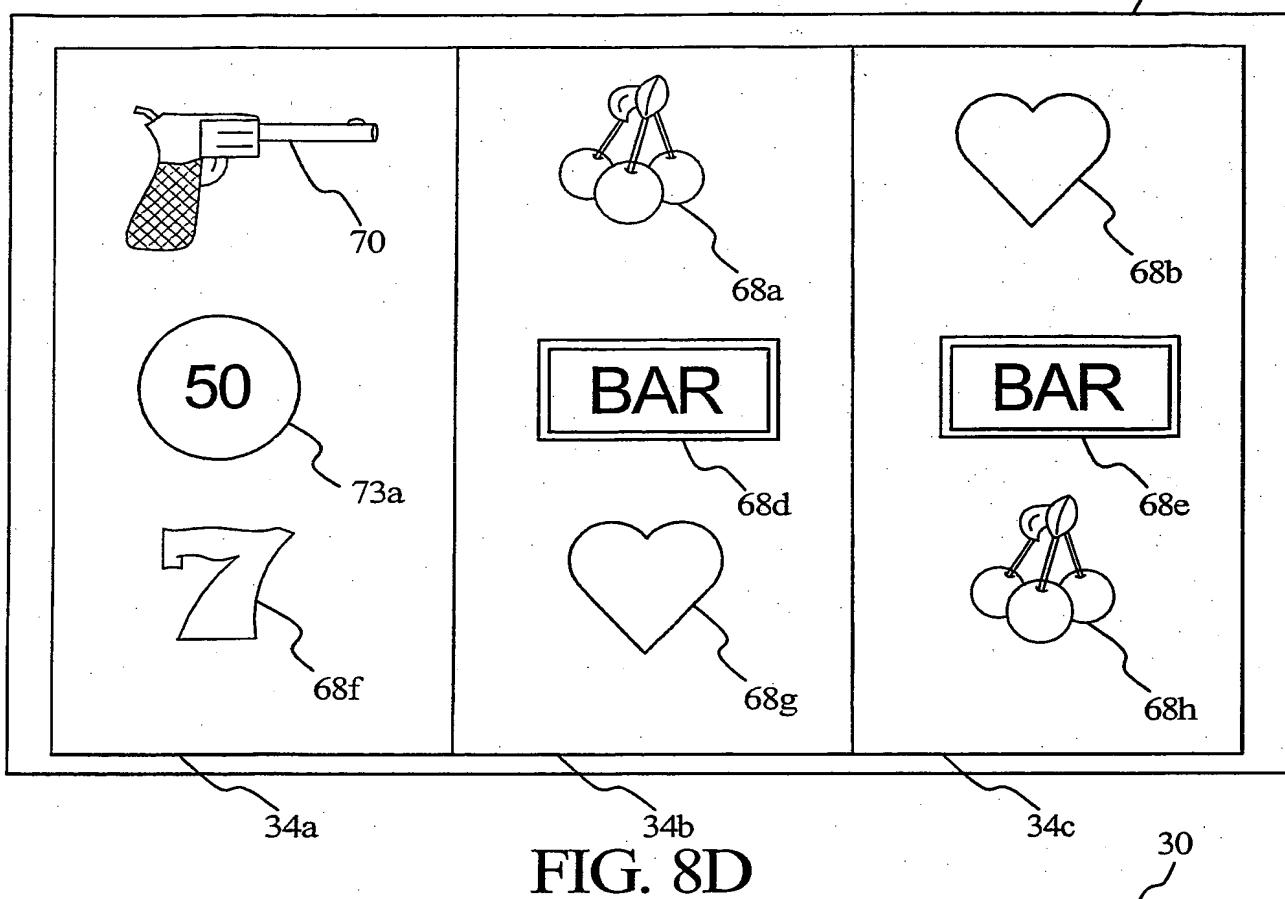
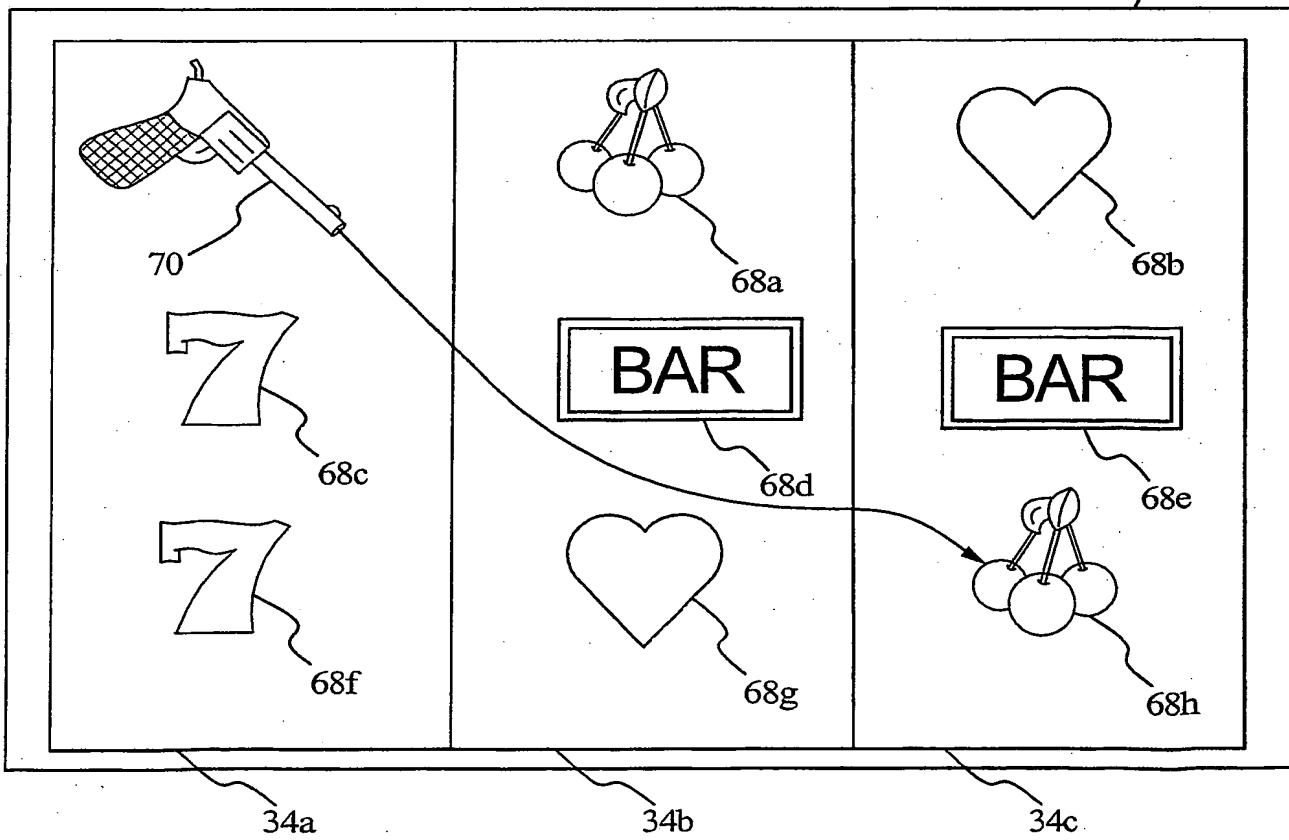


FIG. 8D



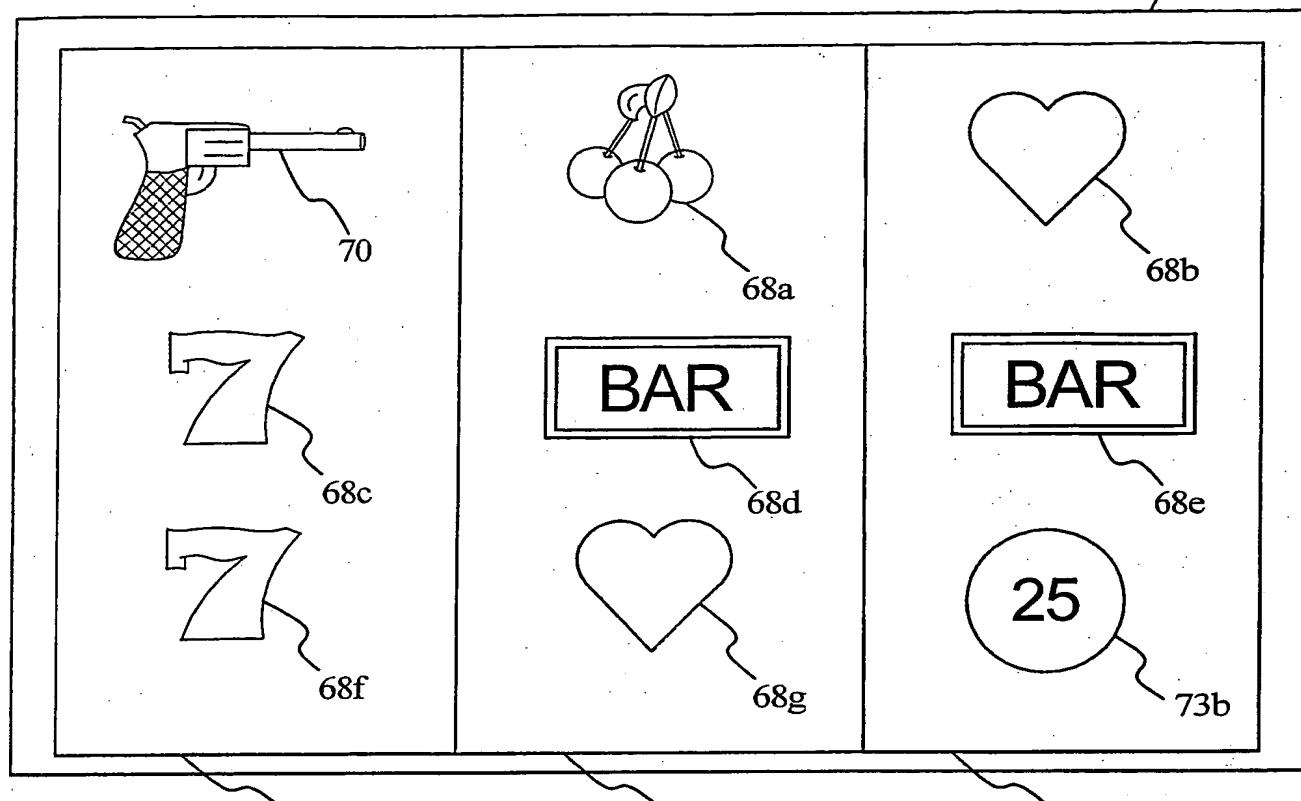
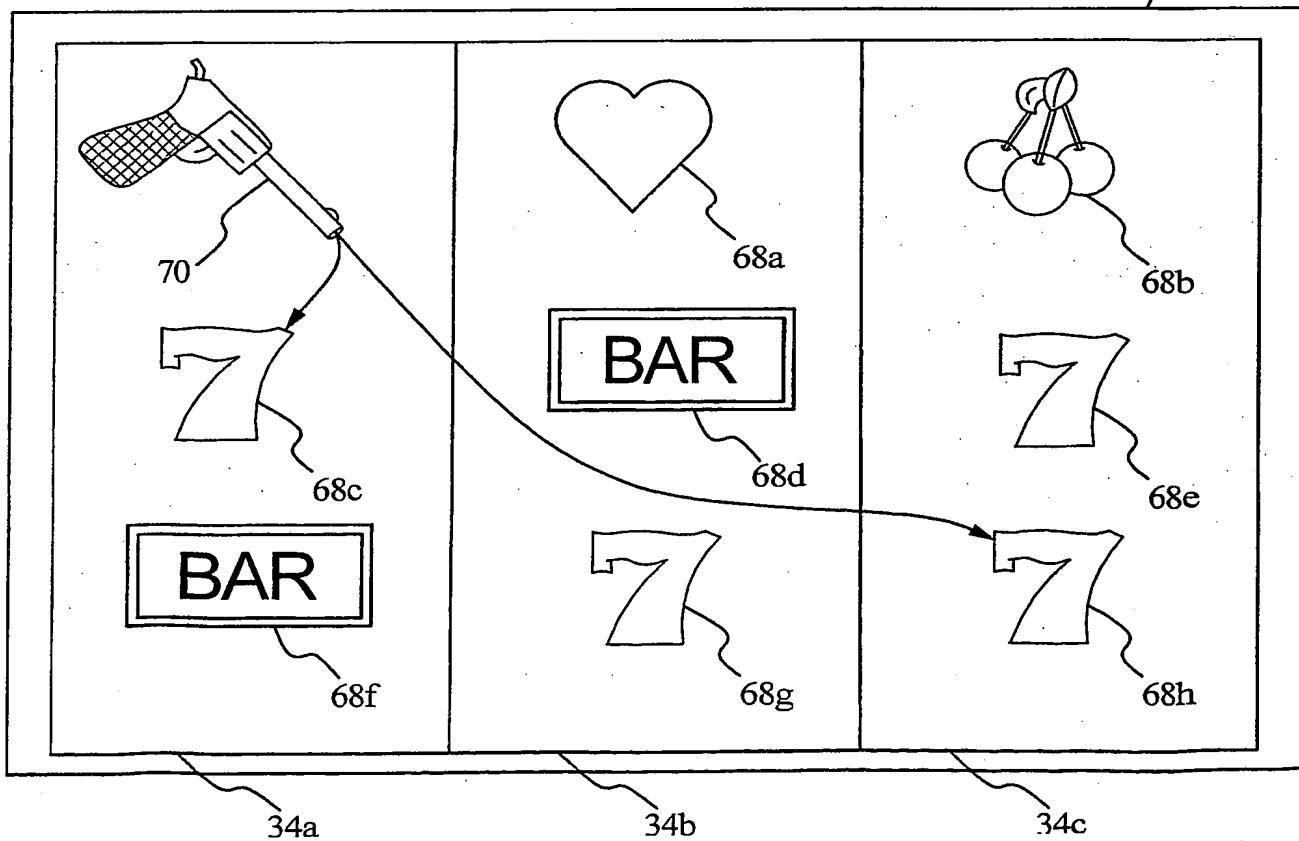
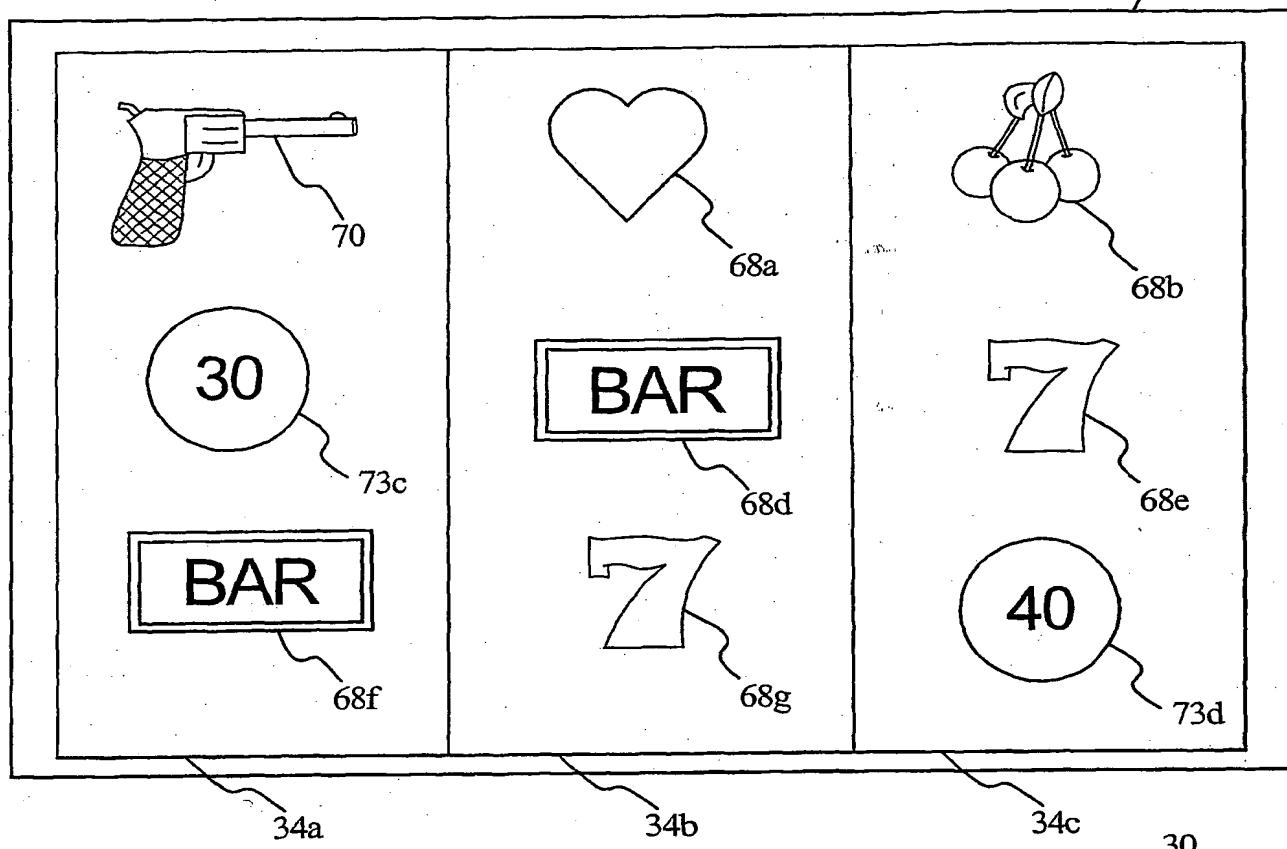
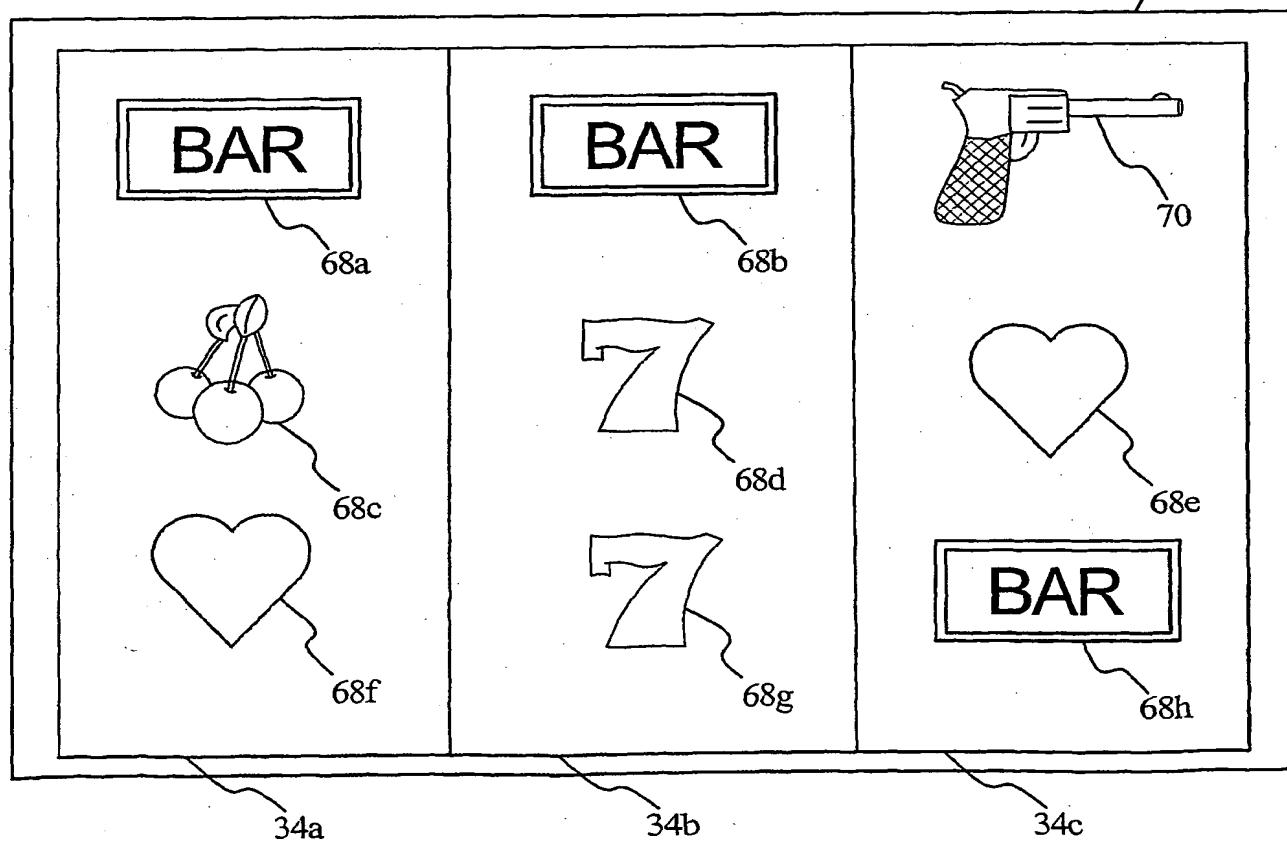
12/19  
FIG. 8E

FIG. 9A



<sup>13/19</sup>  
**FIG. 9B****FIG. 10A**

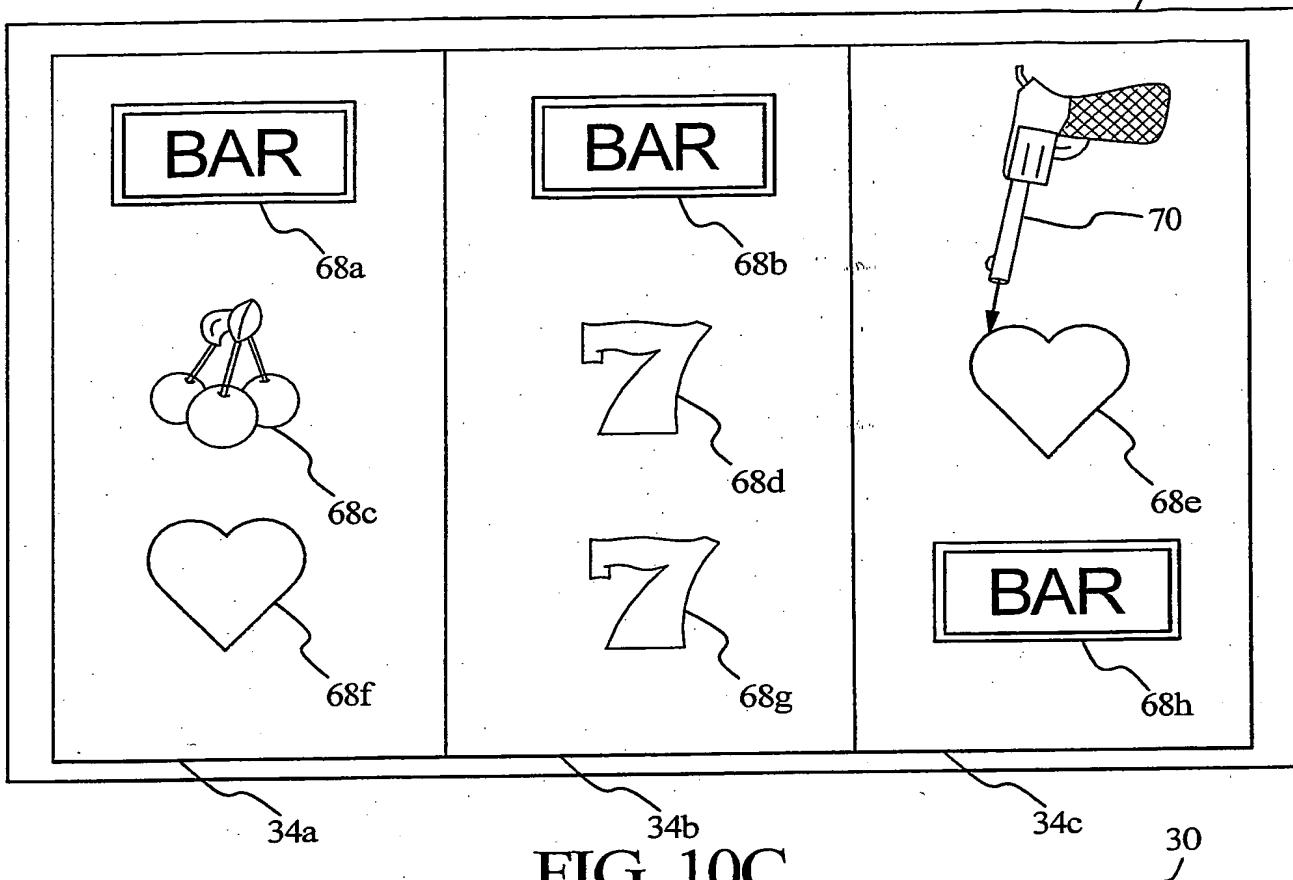
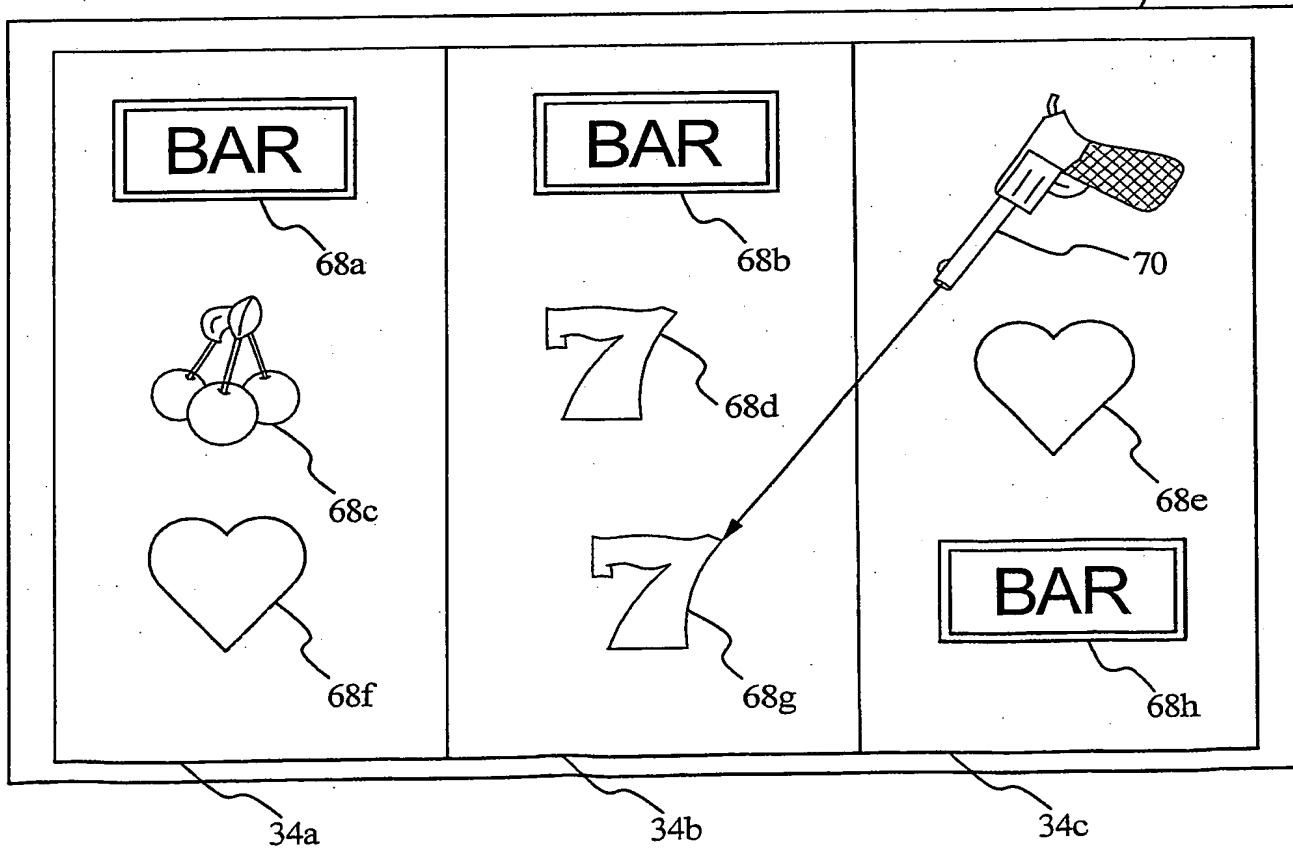
14/19  
FIG. 10B

FIG. 10C



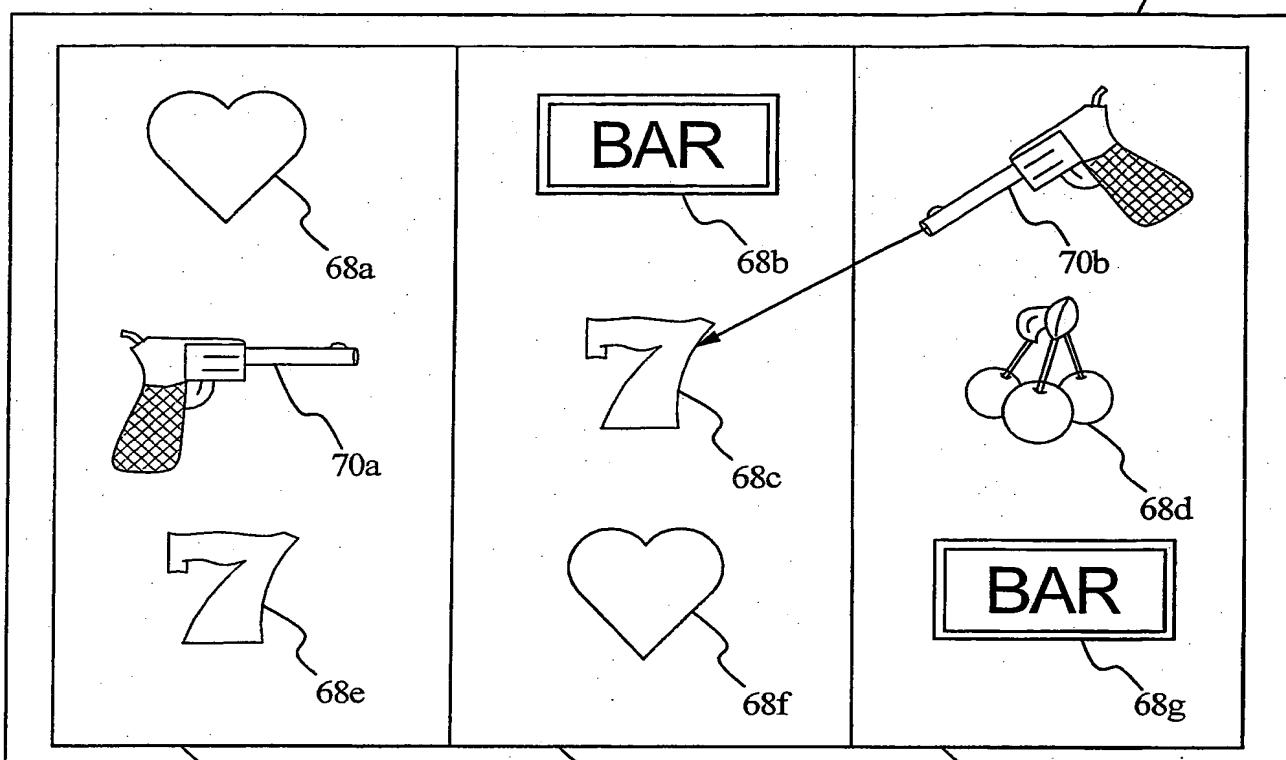
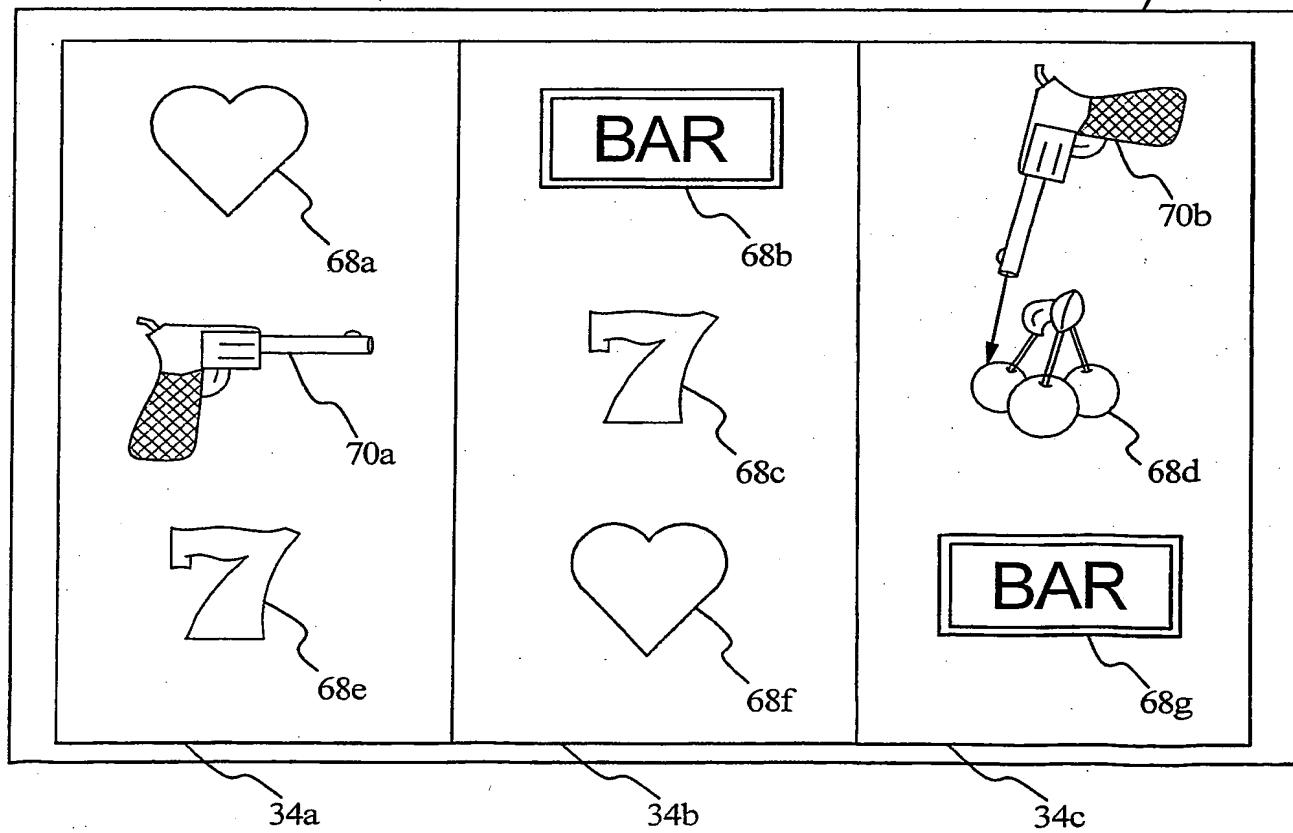
15/19  
FIG. 11A

FIG. 11B



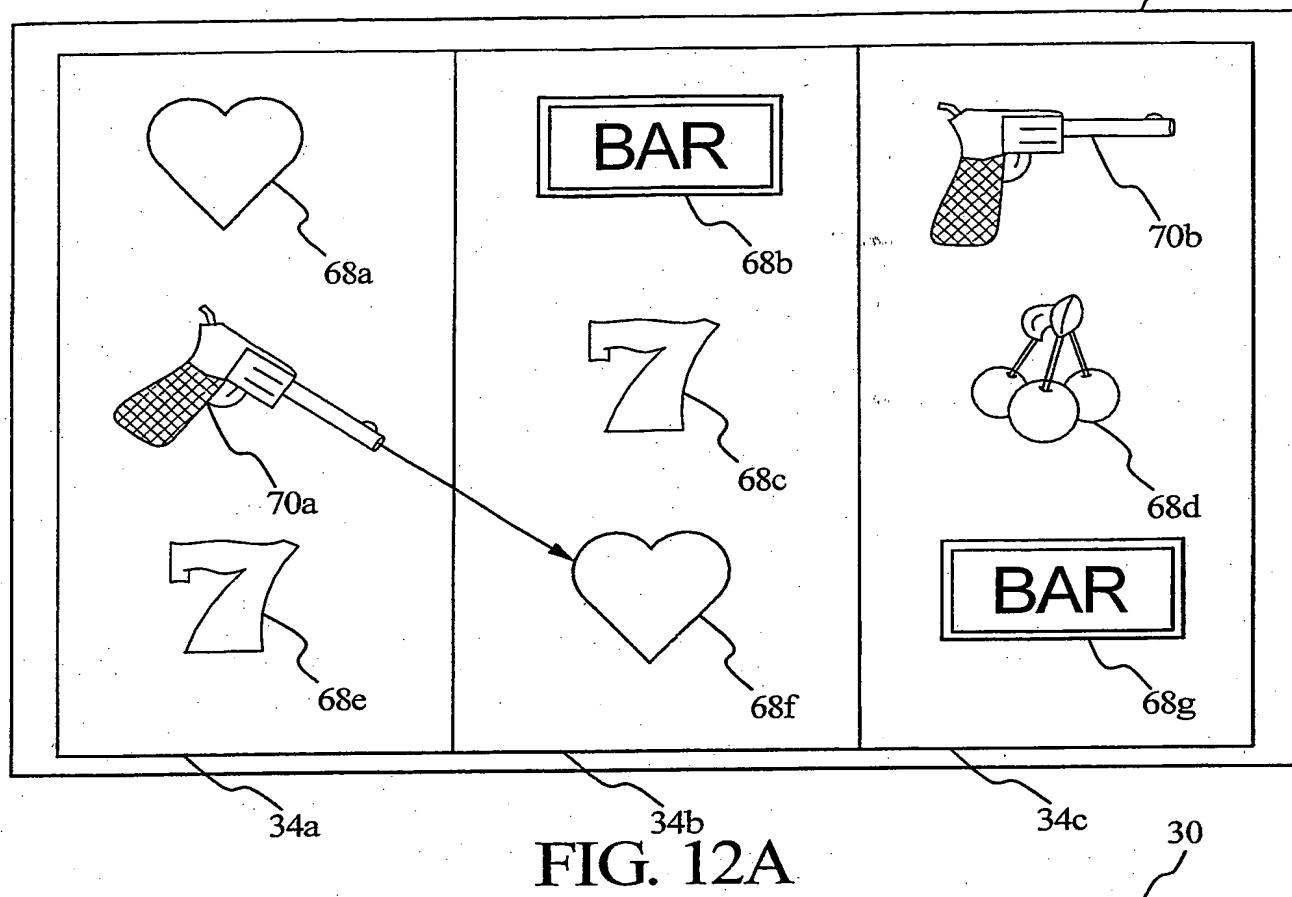
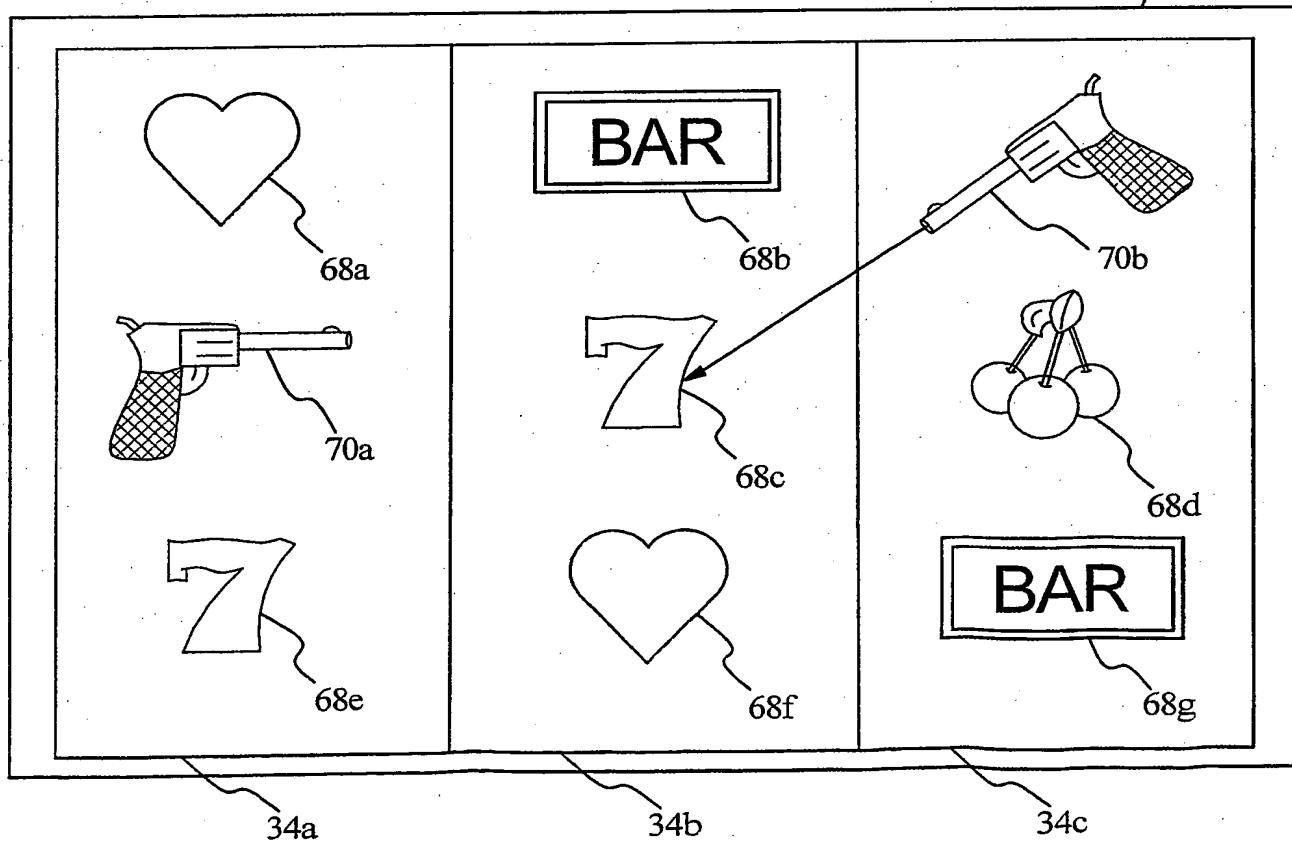
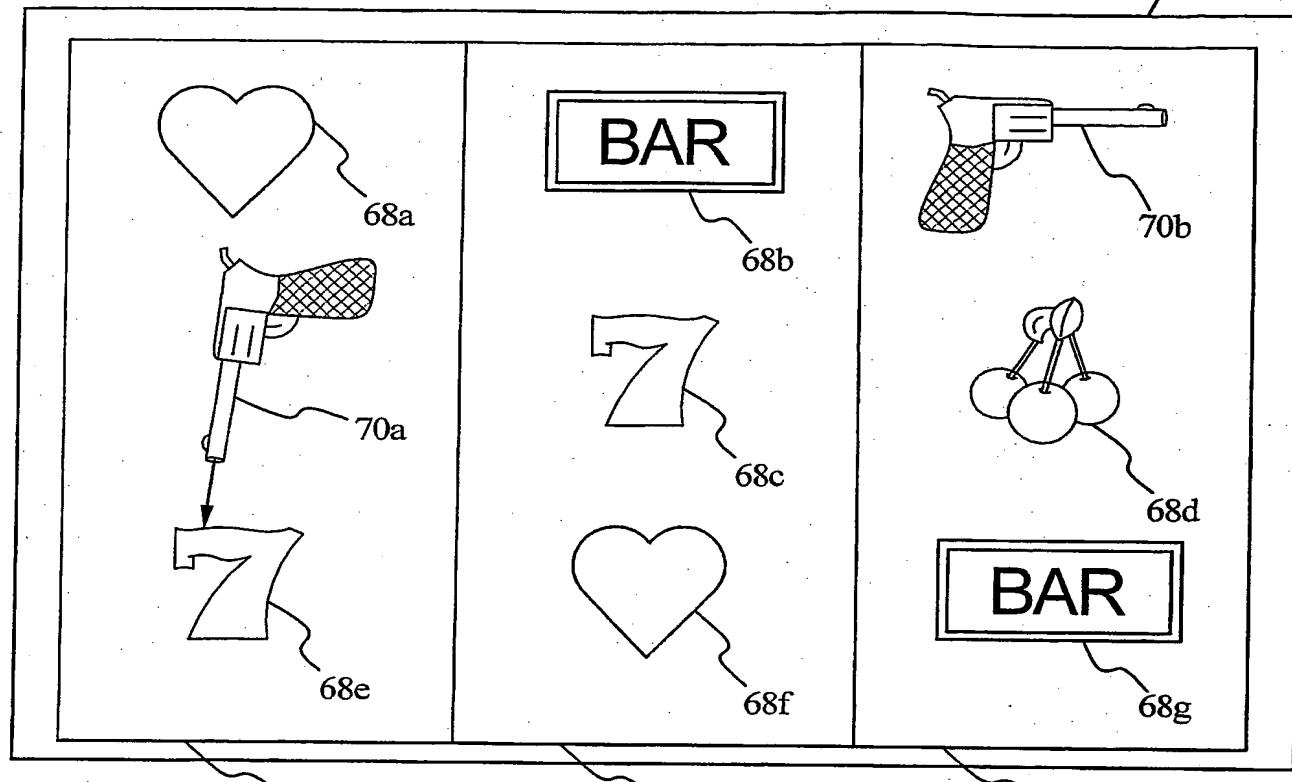
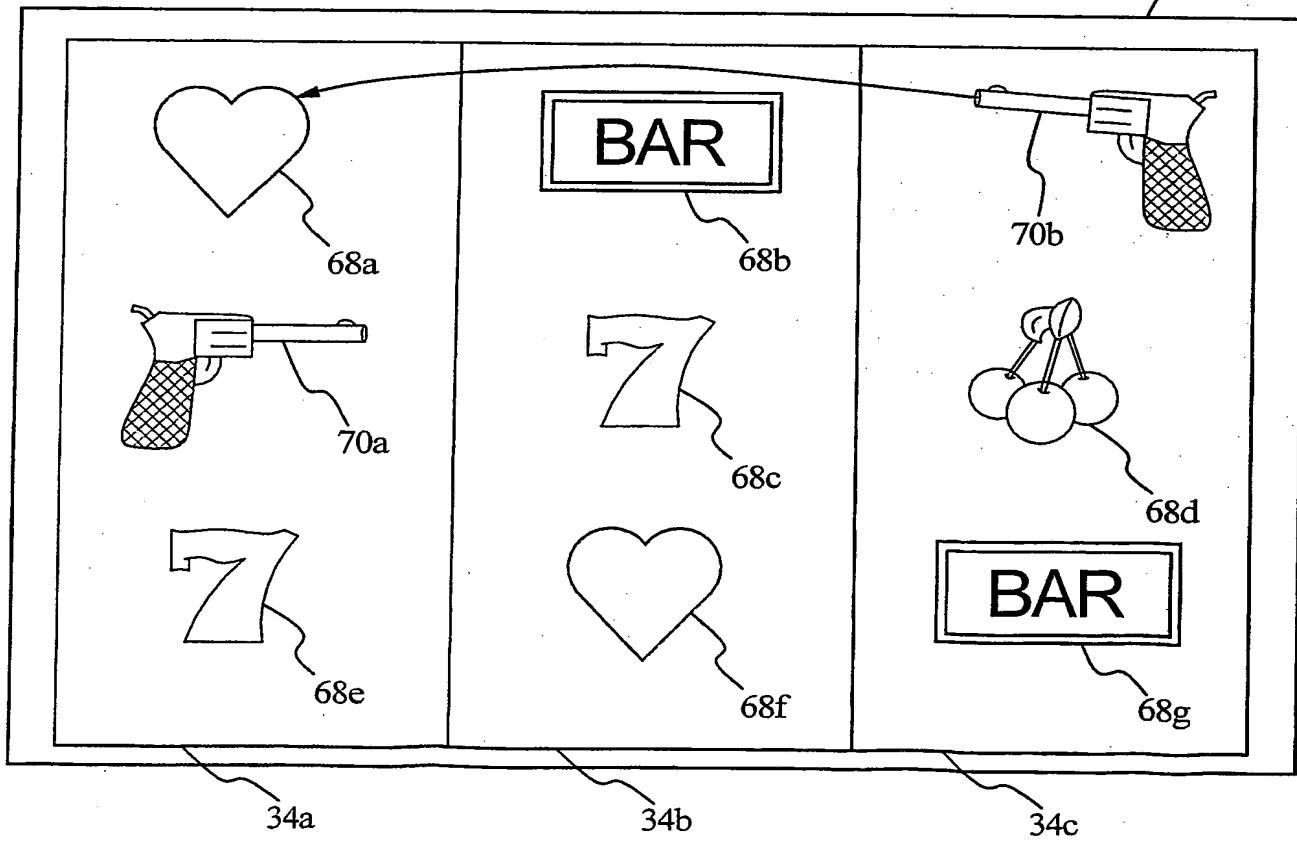
<sup>16/19</sup>  
FIG. 11C

FIG. 12A



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FIG. 12B34a 34b 34c 30  
FIG. 12C

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FIG. 13A

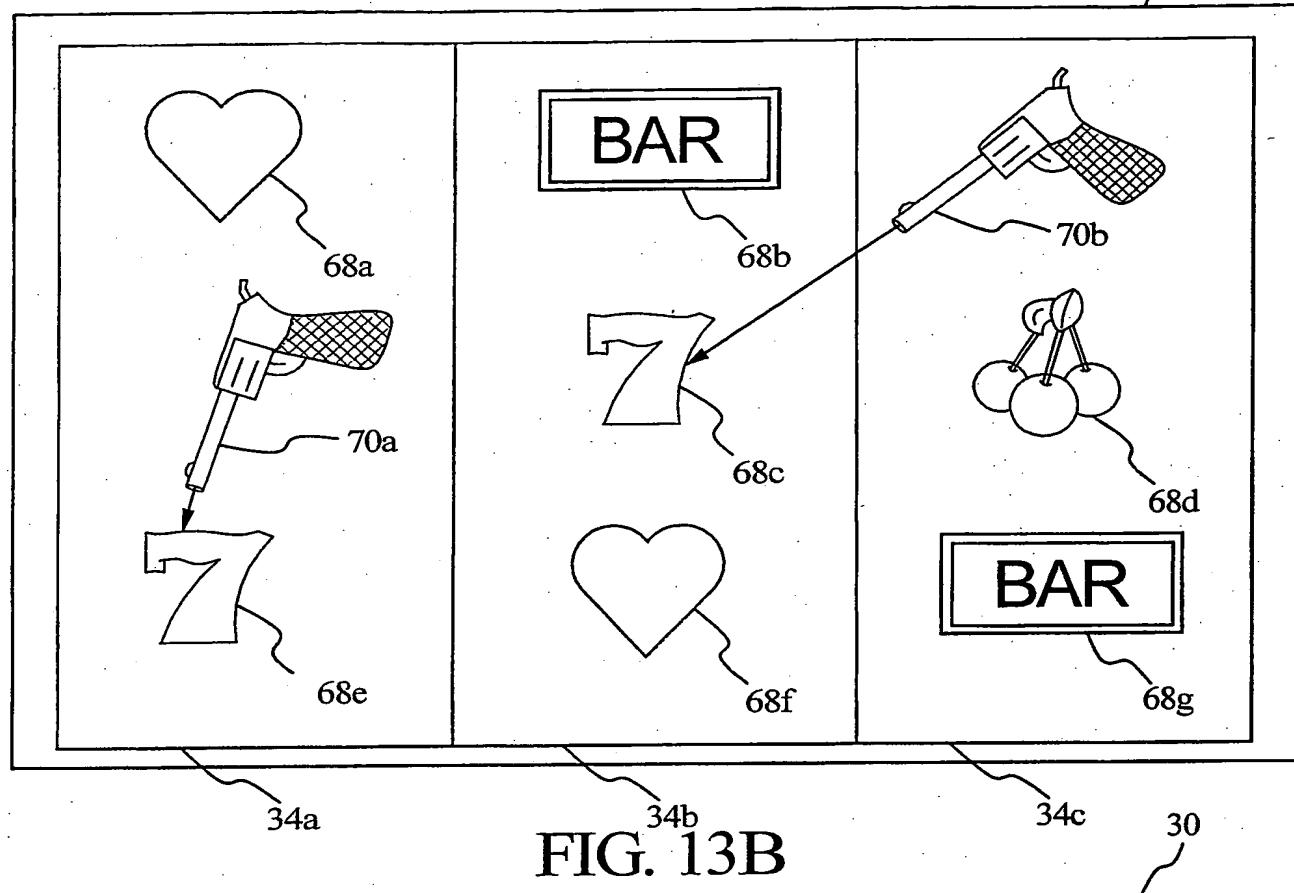
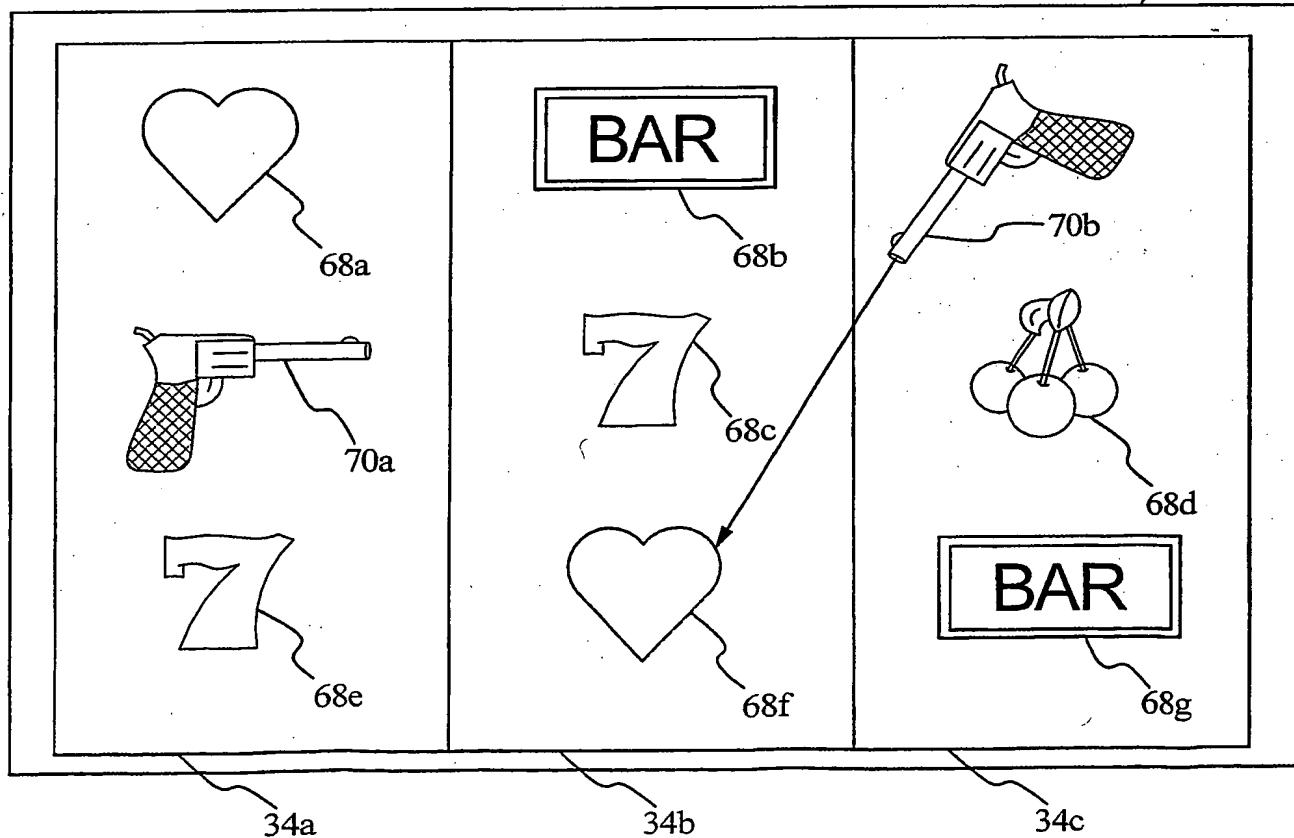


FIG. 13B



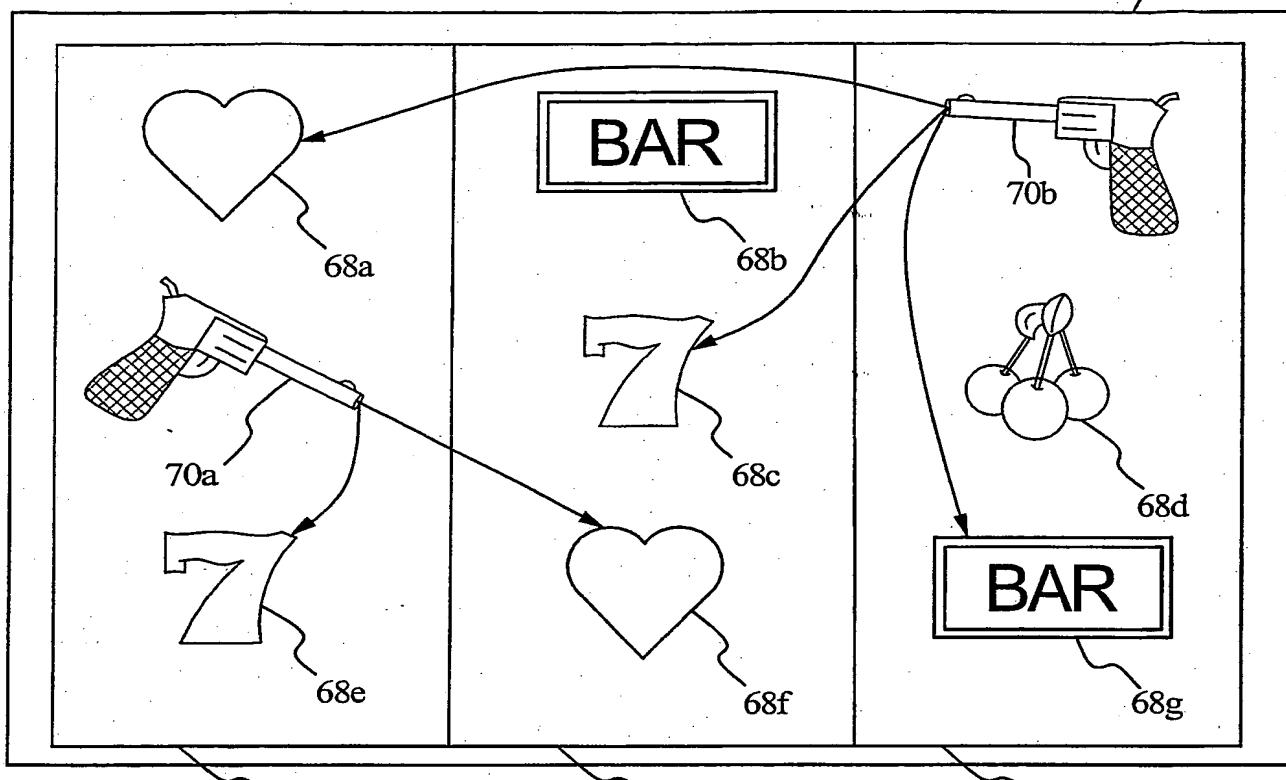
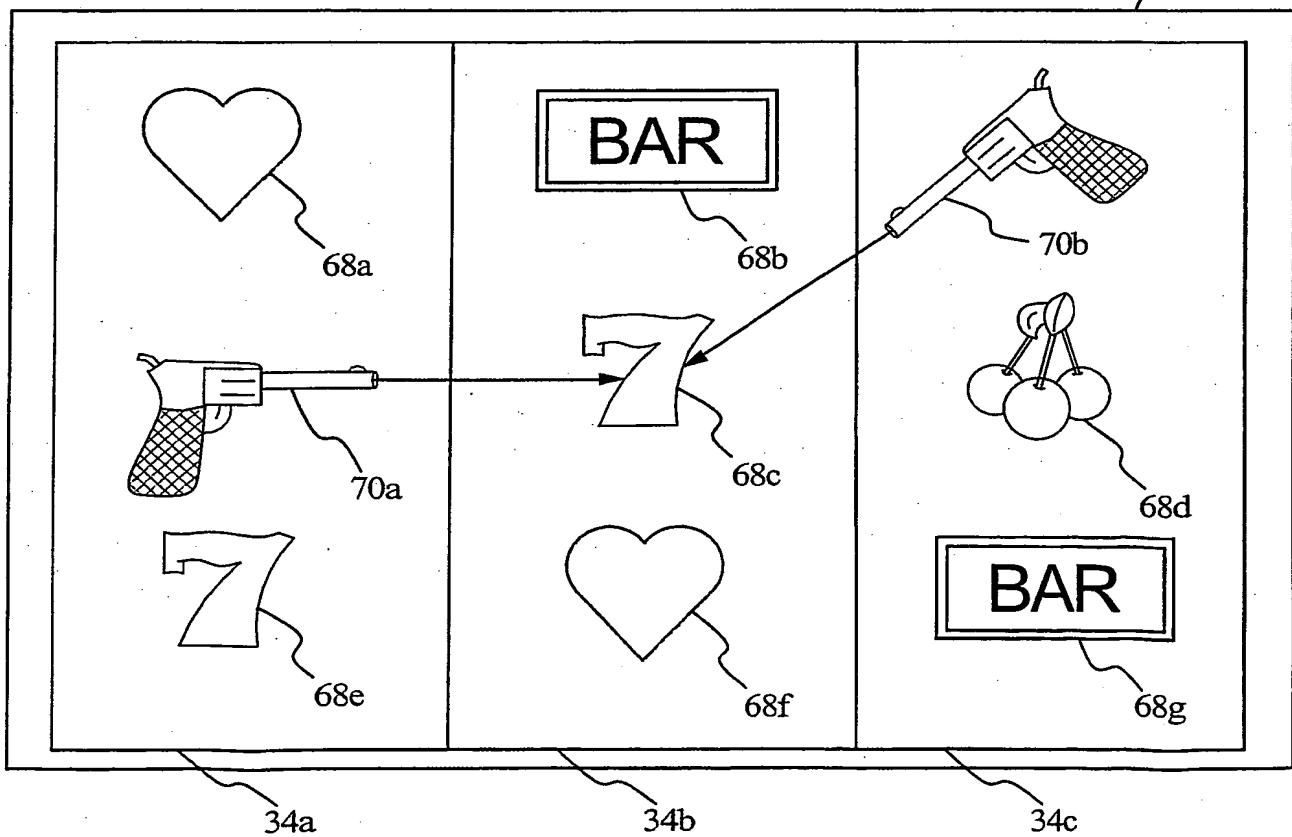
19/19  
FIG. 14

FIG. 15



# INTERNATIONAL SEARCH REPORT

International application No.

PCT/US02/30716

## A. CLASSIFICATION OF SUBJECT MATTER

IPC(7) : G07F 17/34  
US CL : 463/20

According to International Patent Classification (IPC) or to both national classification and IPC

## B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)  
U.S. : 463/20, 16-19;273/138.1,143R

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

## C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category *	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US 6,089,977 A (BENNETT) 18 July 2000 (18.07.2000), Figure 3, Column 1, line 60-Column 2, line 30, and Column 2, line 45-Column 5, line 63.	1-84
X,P	US 6,299,165 B1 (NAGANO) 09 October 2001 (09.10.2001), Figures 5-7B, Column 1, line 50-Column 2, line 57.	1-84

Further documents are listed in the continuation of Box C.

See patent family annex.

\* Special categories of cited documents:

- "A" document defining the general state of the art which is not considered to be of particular relevance
- "E" earlier application or patent published on or after the international filing date
- "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)
- "O" document referring to an oral disclosure, use, exhibition or other means
- "P" document published prior to the international filing date but later than the priority date claimed

"T"

later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention

"X"

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Date of the actual completion of the international search

Date of mailing of the international search report

02 December 2002 (02.12.2002)

10 DEC 2002

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